Figure 130

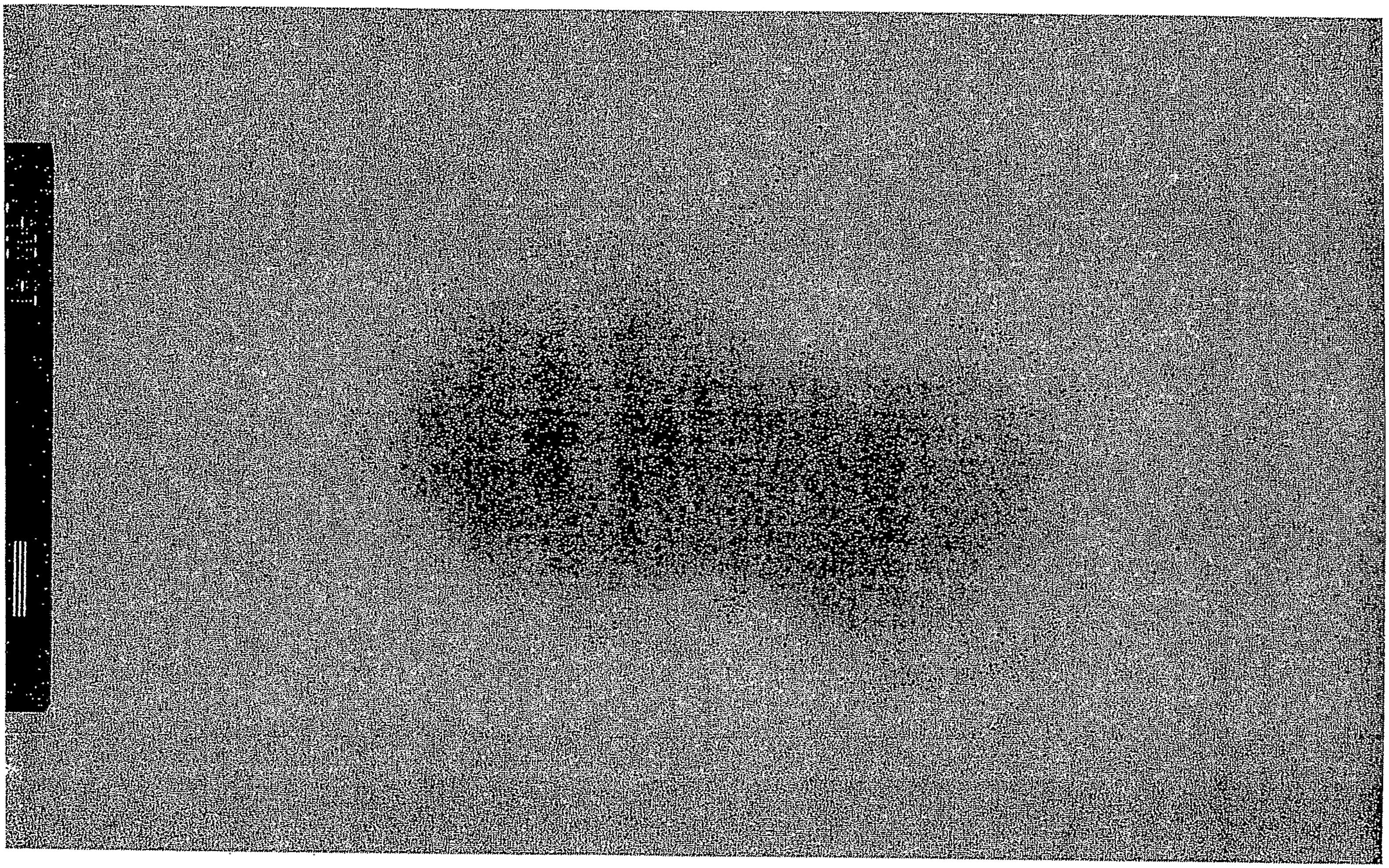


Figure 131

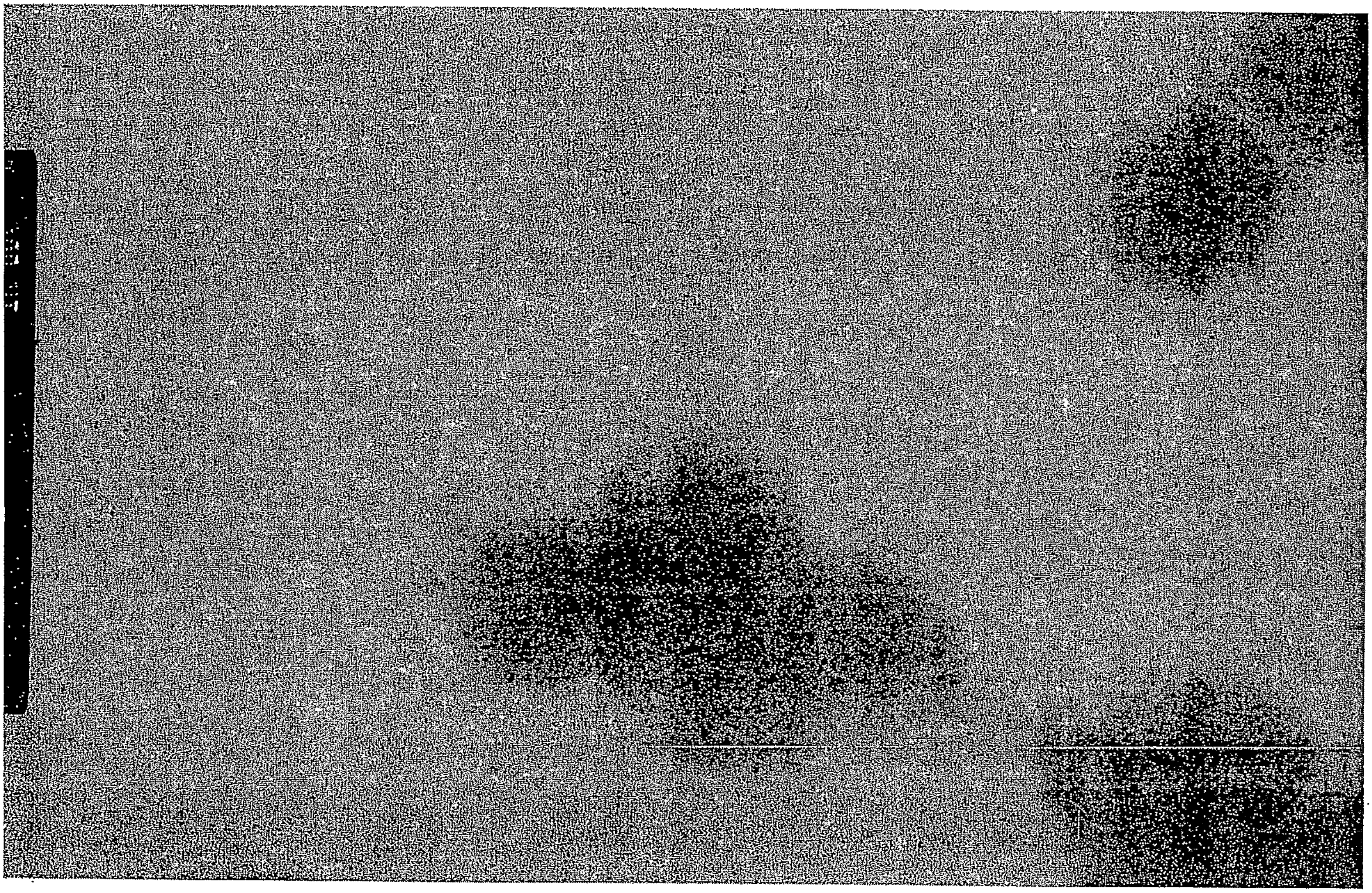


Figure 132

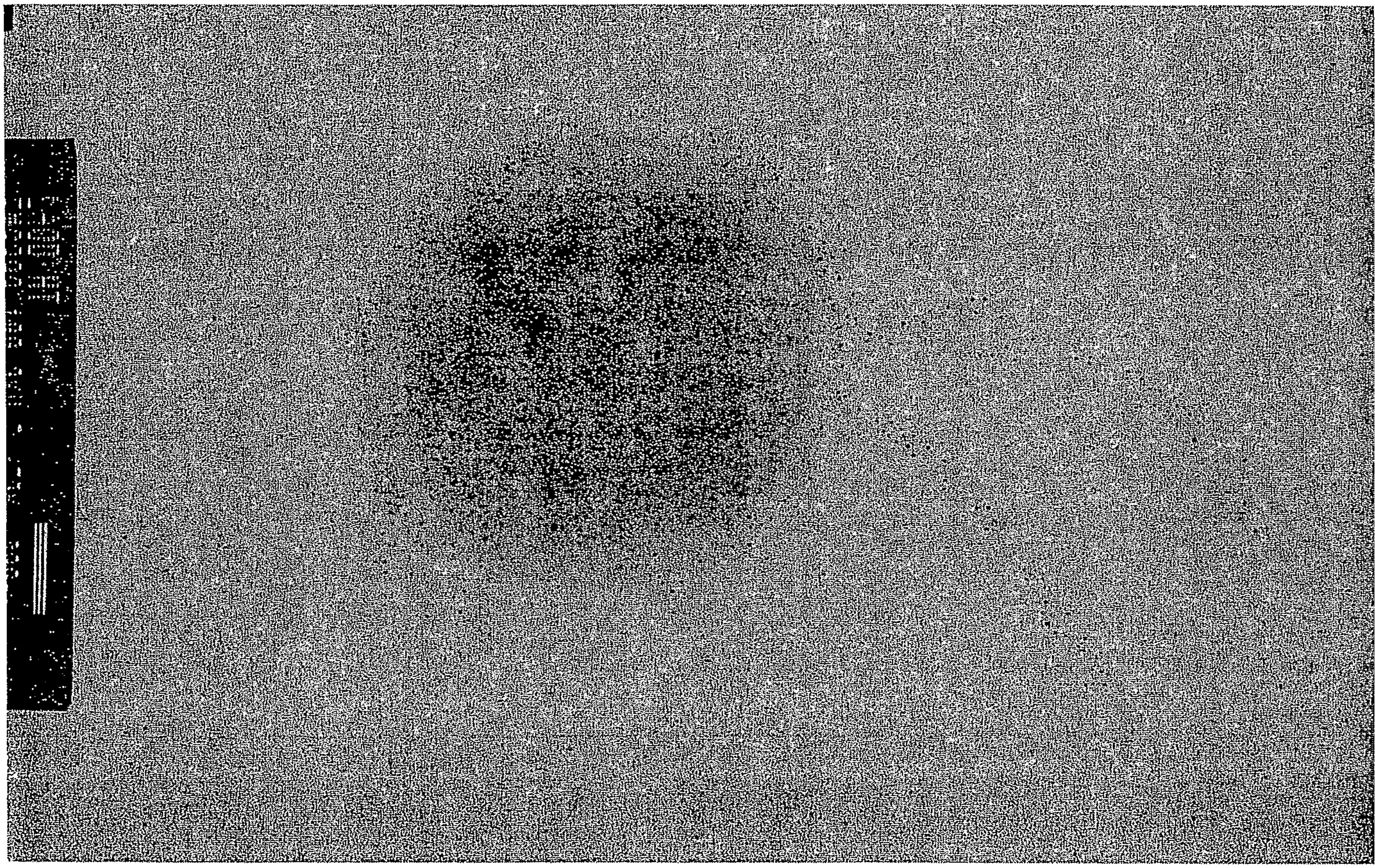


Figure 133

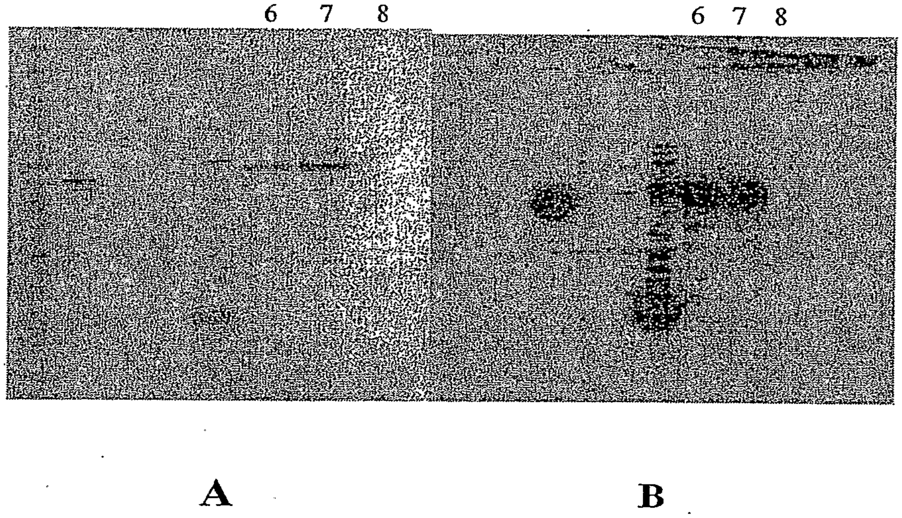


Figure 134

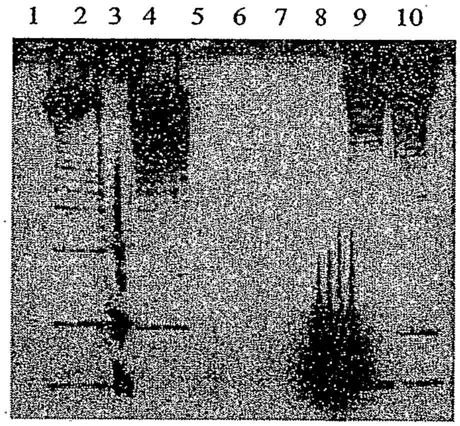
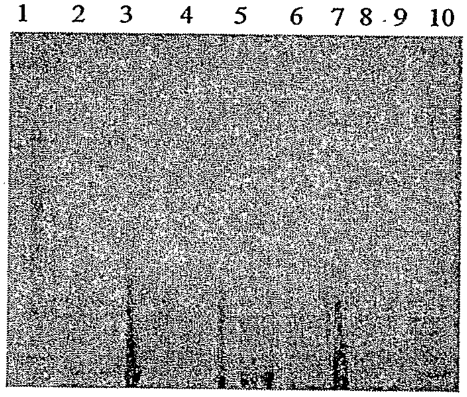


Figure 135



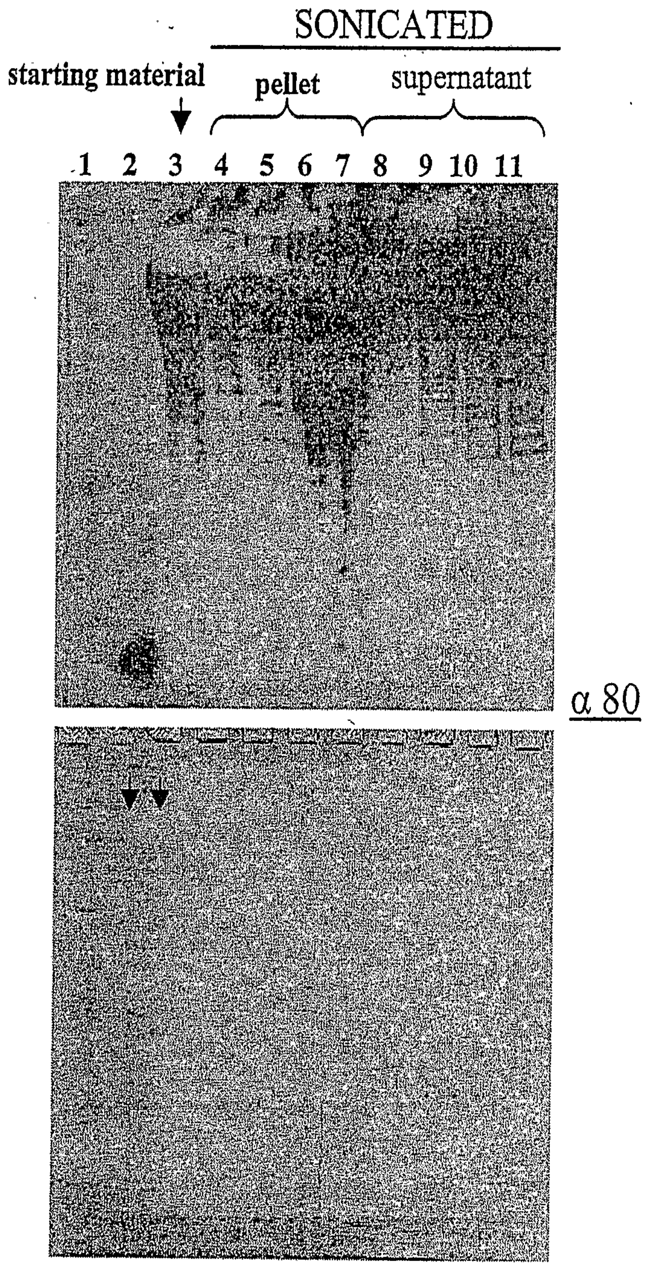
Pilus released by *Lactococcus* sonication

Figure 136A

1. MK
2. GBS 80 (10 ng)
3. L.lactis-AI1 **starting material** (30', 0.2 OD)
4. L.lactis-AI1 (not boiled, 0.33 OD)
5. L.lactis-AI1 (5', 0.33 OD)
6. L.lactis-AI1 (60' d, 0.33 OD)
7. L.lactis-AI1 (30', 0.33 OD)
8. Supernatant (not boiled, 2 OD)
9. Supernatant (5', 2 OD)
10. Supernatant (30', 2 OD)
11. Supernatant (60', 2 OD)

Figure 136B

1. MK
2. L.lactis-AI1 (30', 0.33 OD)
3. L.lactis-AI1 **starting material** (30', 0.2 OD)
4. L.lactis-AI1 (not boiled, 0.33 OD)
5. L.lactis-AI1 (5', 0.33 OD)
6. L.lactis-AI1 (60' d, 0.33 OD)
7. L.lactis-AI1 (30', 0.33 OD)
8. Supernatant (not boiled, 2 OD)
9. Supernatant (5', 2 OD)
10. Supernatant (30', 2 OD)
11. Supernatant (60', 2 OD)



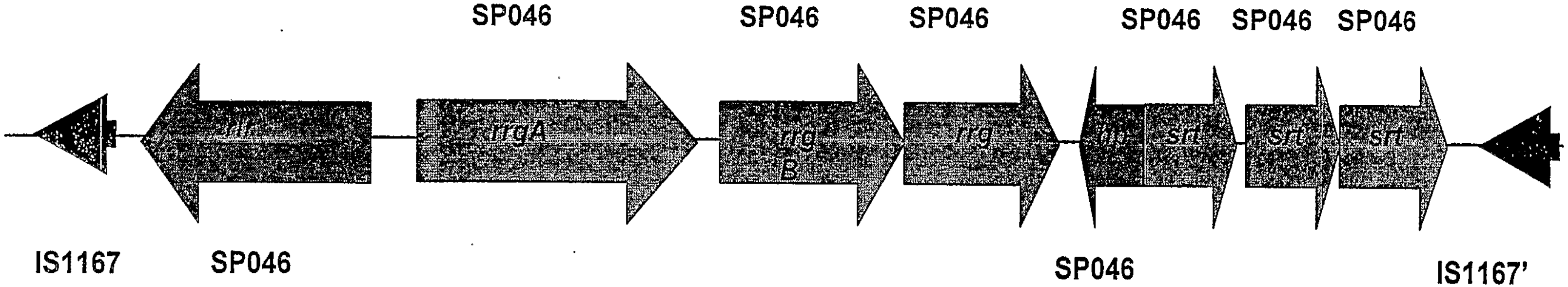

SP046
SP046
SP046
SP046
SP046
SP046
rlr
rrgA
rrg
B
rrg
srt
srt
srt
IS1167
SP046
SP046
IS1167'

Figure 137

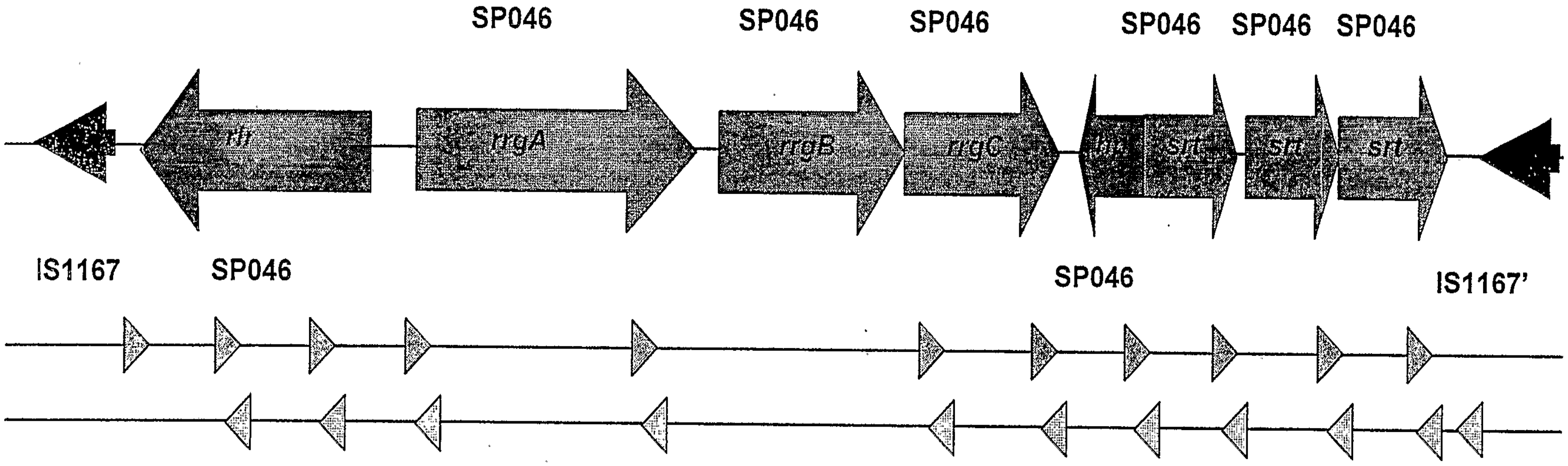
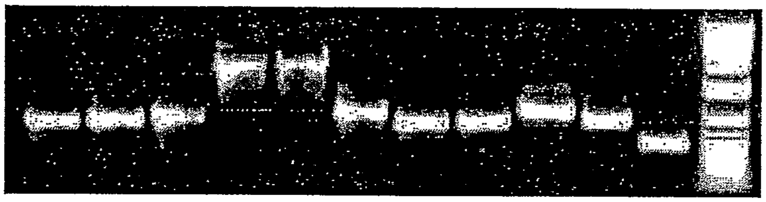

SP046
SP046
SP046
SP046
SP046
SP046
rlr
rrgA
rrgB
rrgC
srt
srt
srt
IS1167
SP046
SP046
IS1167'

Figure 138

A



B

PCR product	contig_length _TIGR4	overlap
1	754	83
2	759	84
3	847	98
4	2550	99
5	2736	99
6	925	99
7	745	87
8	765	94
9	1008	94
10	802	64
11	461	

Figure 139

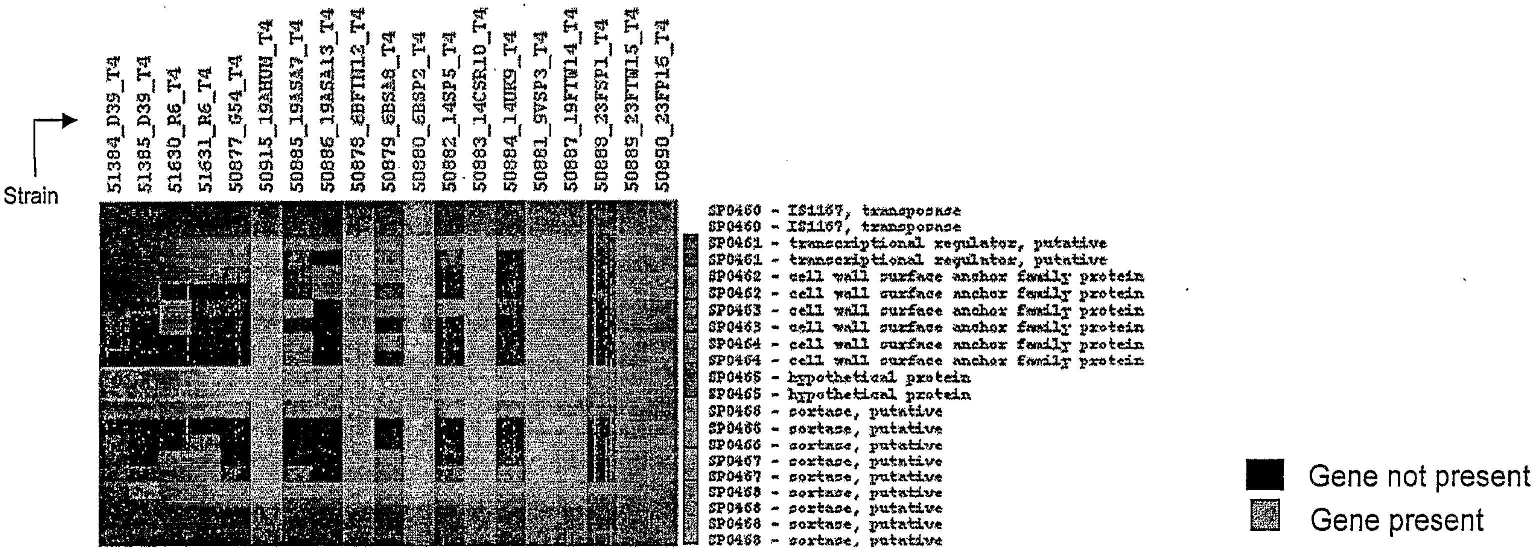

Strain
51384_D39_T4
51385_D39_T4
51630_R6_T4
51631_R6_T4
50877_G54_T4
50915_19AHUH_T4
50885_19ASA7_T4
50886_19ASA13_T4
50875_6BFINL2_T4
50879_6BSA8_T4
50880_6BSP2_T4
50882_14SP5_T4
50883_14CSR10_T4
50884_14UK9_T4
50881_9VSP3_T4
50887_19FTW14_T4
50889_23FSP1_T4
50885_23FTW15_T4
50890_23FP16_T4
SP0460 - IS1167, transposase
SP0460 - IS1167, transposase
SP0461 - transcriptional regulator, putative
SP0461 - transcriptional regulator, putative
SP0462 - cell wall surface anchor family protein
SP0462 - cell wall surface anchor family protein
SP0463 - cell wall surface anchor family protein
SP0463 - cell wall surface anchor family protein
SP0464 - cell wall surface anchor family protein
SP0464 - cell wall surface anchor family protein
SP0465 - hypothetical protein
SP0465 - hypothetical protein
SP0466 - sortase, putative
SP0466 - sortase, putative
SP0466 - sortase, putative
SP0467 - sortase, putative
SP0467 - sortase, putative
SP0468 - sortase, putative
SP0468 - sortase, putative
SP0468 - sortase, putative
SP0468 - sortase, putative
Gene not present
Gene present

Figure 140

Figure 141A

```
ORF2_14CSR       MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEEELTFN
ORF2_19AH        MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEEELTFN
ORF2_19FTW       MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEEELTFN
ORF2_23FP        MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEEELTFN
ORF2_23FTW       MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEEELTFN
ORF2_670         MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEEELTFN
ORF2_6BF         MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEEELTFN
ORF2_6BSP        MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEEELTFN
ORF2_TIGR        MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEEELTFN
ORF2_9VSP        MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEEELTFN
                 ************************************************************

ORF2_14CSR       LDTQQVQLIEHHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_19AH        LDTQQVQLIEHHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_19FTW       LDTQQVQLIEHHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_23FP        LDTQQVQLIEHHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_23FTW       LDTQQVQLIEHHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_670         LDTQQVQLIEHHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_6BF         LDTQQVQLIEHHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_6BSP        LDTQQVQLIEHHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_TIGR        LDTQQVQLIEHHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_9VSP        LDTQQVQLIEHHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
                 ************************************************************

ORF2_14CSR       VRQKCGLLLRSVGLDLVKNQVVGPEYRIRFLIALLQFHFGIEIYDLNDGSMDWVTHMIVQ
ORF2_19AH        VRQKCGLLLRSVGLDLVKNQVVGPEYRIRFLIALLQFHFGIEIYDLNDGSMDWVTHMIVQ
ORF2_19FTW       VRQKCGLLLRSVGLDLVKNQVVGPEYRIRFLIALLQFHFGIEIYDLNDGSMDWVTHMIVQ
ORF2_23FP        VRQKCGLLLRSVGLDLVKNQVVGPEYRIRFLIALLQFHFGIEIYDLNDGSMDWVTHMIVQ
ORF2_23FTW       VRQKCGLLLRSVGLDLVKNQVVGPEYRIRFLIALLQFHFGIEIYDLNDGSMDWVTHMIVQ
ORF2_670         VRQKCGLLLRSVGLDLVKNQVVGPEYRIRFLIALLQFHFGIEIYDLNDGSMDWVTHMIVQ
ORF2_6BF         VRQKCGLLLRSVGLDLVKNQVVGPEYRIRFLIALLQFHFGIEIYDLNDGSMDWVTHMIVQ
ORF2_6BSP        VRQKCGLLLRSVGLDLVKNQVVGPEYRIRFLIALLQFHFGIEIYDLNDGSMDWVTHMIVQ
ORF2_TIGR        VRQKCGLLLRSVGLDLVKNQVVGPEYRIRFLIALLQFHFGIEIYDLNDGSMDWVTHMIVQ
ORF2_9VSP        VRQKCGLLLRSVGLDLVKNQVVGPEYRIRFLIALLQFHFGIEIYDLNDGSMDWVTHMIVQ
                 ************************************************************

ORF2_14CSR       SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMYPILMEHCQ
ORF2_19AH        SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMYPILMEHCQ
ORF2_19FTW       SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMYPILMEHCQ
ORF2_23FP        SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMYPILMEHCQ
ORF2_23FTW       SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMYPILMEHCQ
ORF2_670         SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMYPILMEHCQ
ORF2_6BF         SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMYPILMEHCQ
ORF2_6BSP        SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMYPILMEHCQ
ORF2_TIGR        SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMYPILMEHCQ
ORF2_9VSP        SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMYPILMEHCQ
                 ************************************************************

ORF2_14CSR       TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLLSKF
ORF2_19AH        TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLLSKF
ORF2_19FTW       TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLLSKF
ORF2_23FP        TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLLSKF
ORF2_23FTW       TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLLSKF
ORF2_670         TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLLSKF
ORF2_6BF         TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLLSKF
ORF2_6BSP        TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLLSKF
ORF2_TIGR        TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLLSKF
ORF2_9VSP        TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLLSKF
                 ************************************************************
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Figure 141B

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ORF2_14CSR     KNILGNDISNSLSFLTALTFLTRTFLFGLQNLVPYYNYYEHYGIESDKPLYHISKAIVQE
ORF2_19AH      KNILGNDISNSLSFLTALTFLTRTFLFGLQNLVPYYNYYEHYGIESDKPLYHISKAIVQE
ORF2_19FTW     KNILGNDISNSLSFLTALTFLTRTFLFGLQNLVPYYNYYEHYGIESDKPLYHISKAIVQE
ORF2_23FP      KNILGNDISNSLSFLTALTFLTRTFLFGLQNLVPYYNYYEHYGIESDKPLYHISKAIVQE
ORF2_23FTW     KNILGNDISNSLSFLTALTFLTRTFLFGLQNLVPYYNYYEHYGIESDKPLYHISKAIVQE
ORF2_670       KNILGNDISNSLSFLTALTFLTRTFLFGLQNLVPYYNYYEHYGIESDKPLYHISKAIVQE
ORF2_6BF       KNILGNDISNSLSFLTALTFLTRTFLFGLQNLVPYYNYYEHYGIESDKPLYHISKAIVQE
ORF2_6BSP      KNILGNDISNSLSFLTALTFLTRTFLFGLQNLVPYYNYYEHYGIESDKPLYHISKAIVQE
ORF2_TIGR      KNILGNDISNSLSFLTALTFLTRTFLFGLQNLVPYYNYYEHYGIESDKPLYHISKAIVQE
ORF2_9VSP      KNILGNDISNSLSFLTALTFLTRTFLFGLQNLVPYYNYYEHYGIESDKPLYHISKAIVQE
               ************************************************************

ORF2_14CSR     WMTEQKIEGVIDQHRLYLFSLYLTETIFSSLPAIPIFIILNNQADVNLIKSIILRNFTDK
ORF2_19AH      WMTEQKIEGVIDQHRLYLFSLYLTETIFSSLPAIPIFIILNNQADVNLIKSIILRNFTDK
ORF2_19FTW     WMTEQKIEGVIDQHRLYLFSLYLTETIFSSLPAIPIFIILNNQADVNLIKSIILRNFTDK
ORF2_23FP      WMTEQKIEGVIDQHRLYLFSLYLTETIFSSLPAIPIFIILNNQADVNLIKSIILRNFTDK
ORF2_23FTW     WMTEQKIEGVIDQHRLYLFSLYLTETIFSSLPAIPIFIILNNQADVNLIKSIILRNFTDK
ORF2_670       WMTEQKIEGVIDQHRLYLFSLYLTETIFSSLPAIPIFIILNNQADVNLIKSIILRNFTDK
ORF2_6BF       WMTEQKIEGVIDQHRLYLFSLYLTETIFSSLPAIPIFIILNNQADVNLIKSIILRNFTDK
ORF2_6BSP      WMTEQKIEGVIDQHRLYLFSLYLTETIFSSLPAIPIFIILNNQADVNLIKSIILRNFTDK
ORF2_TIGR      WMTEQKIEGVIDQHRLYLFSLYLTETIFSSLPAIPIFIILNNQADVNLIKSIILRNFTDK
ORF2_9VSP      WMTEQKIEGVIDQHRLYLFSLYLTETIFSSLPAIPIFIILNNQADVNLIKSIILRNFTDK
               ************************************************************

ORF2_14CSR     VASVTGYNILISPPPSEEHLTEPLIIITTKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR
ORF2_19AH      VASVTGYNILISPPPSEEHLTEPLIIITTKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR
ORF2_19FTW     VASVTGYNILISPPPSEEHLTEPLIIITTKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR
ORF2_23FP      VASVTGYNILISPPPSEEHLTEPLIIITTKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR
ORF2_23FTW     VASVTGYNILISPPPSEEHLTEPLIIITTKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR
ORF2_670       VASVTGYNILISPPPSEEHLTEPLIIITTKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR
ORF2_6BF       VASVTGYNILISPPPSEEHLTEPLIIITTKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR
ORF2_6BSP      VASVTGYNILISPPPSEEHLTEPLIIITTKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR
ORF2_TIGR      VASVTGYNILISPPPSEEHLTEPLIIITTKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR
ORF2_9VSP      VASVTGYNILISPPPSEEHLTEPLIIITTKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR
               ************************************************************

ORF2_14CSR     LIYQTIVDIRKEAFDKRVAMIAKKAHYLL
ORF2_19AH      LIYQTIVDIRKEAFDKRVAMIAKKAHYLL
ORF2_19FTW     LIYQTIVDIRKEAFDKRVAMIAKKAHYLL
ORF2_23FP      LIYQTIVDIRKEAFDKRVAMIAKKAHYLL
ORF2_23FTW     LIYQTIVDIRKEAFDKRVAMIAKKAHYLL
ORF2_670       LIYQTIVDIRKEAFDKRVAMIAKKAHYLL
ORF2_6BF       LIYQTIVDIRKEAFDKRVAMIAKKAHYLL
ORF2_6BSP      LIYQTIVDIRKEAFDKRVAMIAKKAHYLL
ORF2_TIGR      LIYQTIVDIRKEAFDKRVAMIAKKAHYLL
ORF2_9VSP      LIYQTIVDIRKEAFDKRVAMIAKKAHYLL
               *****************************
```

Figure 142A

```
ORF3_19AH      MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSPAIGKVVIKETGEGGALLGDAVF
ORF3_23FP      MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSPAIGKVVIKETGEGGALLGDAVF
ORF3_14CSR     MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSPAIGKVVIKETGEGGALLGDAVF
ORF3_670       MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSPAIGKVVIKETGEGGALLGDAVF
ORF3_6BF       MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSPAIGKVVIKETGEGGALLGDAVF
ORF3_6BSP      MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSPAIGKVVIKETGEGGALLGDAVF
ORF3_19FTW     MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSPAIGKVVIKETGEGGALLGDAVF
ORF3_9VSP      MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSPAIGKVVIKETGEGGALLGDAVF
ORF3_23FTW     MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSPAIGKVVIKETGEGGALLGDAVF
ORF3_TIGR      MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSPAIGKVVIKETGEGGALLGDAVF
               ************************************************************

ORF3_19AH      ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPPVGYKPSTKQWTVEVEKNGRT
ORF3_23FP      ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPPVGYKPSTKQWTVEVEKNGRT
ORF3_14CSR     ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPPVGYKPSTKQWTVEVEKNGRT
ORF3_670       ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPPVGYKPSTKQWTVEVEKNGRT
ORF3_6BF       ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPPVGYKPSTKQWTVEVEKNGRT
ORF3_6BSP      ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPPVGYKPSTKQWTVEVEKNGRT
ORF3_19FTW     ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPPVGYKPSTKQWTVEVEKNGRT
ORF3_9VSP      ELKNNTNGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPPVGYKPSTKQRTVEVEKNGRT
ORF3_23FTW     ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPPVGYKPSTKQWTVEVEKNGRT
ORF3_TIGR      ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPPVGYKPSTKQWTVEVEKNGRT
               ******:****************************************** **********

ORF3_19AH      TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKALNPNPYERVIPEG
ORF3_23FP      TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKALNPNPYERVIPEG
ORF3_14CSR     TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKALNPNPYERVIPEG
ORF3_670       TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKALNPNPYERVIPEG
ORF3_6BF       TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKALNPNPYERVIPEG
ORF3_6BSP      TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKALNPNPYERVIPEG
ORF3_19FTW     TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKALNPNPYERVIPEG
ORF3_9VSP      TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKALNPNPYERVIPEG
ORF3_23FTW     TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKALNPNPYERVIPEG
ORF3_TIGR      TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKALNPNPYERVIPEG
               ************************************************************

ORF3_19AH      TLSKRIYQVNNLDDNQYGIELTVSGKTTVETKEASTPLDVVILLDNSNSMSNIRHNHAHR
ORF3_23FP      TLSKRIYQVNNLDDNQYGIELTVSGKTTVETKEASTPLDVVILLDNSNSMSNIRHNHAHR
ORF3_14CSR     TLSKRIYQVNNLDDNQYGIELTVSGKTTVETKEASTPLDVVILLDNSNSMSNIRHNHAHR
ORF3_670       TLSKRIYQVNNLDDNQYGIELTVSGKTTVETKEASTPLDVVILLDNSNSMSNIRHNHAHR
ORF3_6BF       TLSKRIYQVNNLDDNQYGIELTVSGKTTVETKEASTPLDVVILLDNSNSMSNIRHNHAHR
ORF3_6BSP      TLSKRIYQVNNLDDNQYGIELTVSGKTTVETKEASTPLDVVILLDNSNSMSNIRHNHAHR
ORF3_19FTW     TLSKRIYQVNNLDDNQYGIELTVSGKTVYERKDKSVPLDVVILLDNSNSMSNIRNKNARR
ORF3_9VSP      TLSKRIYQVNNLDDNQYGIELTVSGKTVYERKDKSVPLDVVILLDNSNSMSNIRNKNARR
ORF3_23FTW     TLSKRIYQVNNLDDNQYGIELTVSGKTVYEQKDKSVPLDVVILLDNSNSMSNIRNKNARR
ORF3_TIGR      TLSKRIYQVNNLDDNQYGIELTVSGKTVYEQKDKSVPLDVVILLDNSNSMSNIRNKNARR
               ***************************. * *: *.******************:::*:*

ORF3_19AH      AEKAGEATRALVDKITSNPDNRVALVTYGSTIFDGSEATVEKGVADANGKILNDSALWTF
ORF3_23FP      AEKAGEATRALVDKITSNPDNRVALVTYGSTIFDGSEATVEKGVADANGKILNDSALWTF
ORF3_14CSR     AEKAGEATRALVDKITSNPDNRVALVTYGSTIFDGSEATVEKGVADANGKILNDSALWTF
ORF3_670       AEKAGEATRALVDKITSNPDNRVALVTYGSTIFDGSEATVEKGVADANGKILNDSALWTF
ORF3_6BF       AEKAGEATRALVDKITSNPDNRVALVTYGSTIFDGSEATVEKGVADANGKILNDSALWTF
ORF3_6BSP      AEKAGEATRALVDKITSNPDNRVALVTYGSTIFDGSEATVEKGVADANGKILNDSALWTF
ORF3_19FTW     AERAGEATRSLIDKITSDPENRVALVTYASTIFDGTEFTVEKGVADKNGKRLNDSLFWNY
ORF3_9VSP      AERAGEATRSLIDKITSDPENRVALVTYASTIFDGTEFTVEKGVADKNGKRLNDSLFWNY
ORF3_23FTW     AERAGEATRSLIDKITSDPENRVALVTYASTIFDGTEFTVEKGVADKNGKRLNDSLFWNY
ORF3_TIGR      AERAGEATRSLIDKITSDSENRVALVTYASTIFDGTEFTVEKGVADKNGKRLNDSLFWNY
               **:******:*:*****:.:********.******:* ******** *** **** :*.:
```

Figure 142B

```
ORF3_19AH      DRTTFTAKTYNYSFLNLTSDPTDIQTIKDRIPSDAEELNKDKLMYQFGATFTQKALMTAD
ORF3_23FP      DRTTFTAKTYNYSFLNLTSDPTDIQTIKDRIPSDAEELNKDKLMYQFGATFTQKALMTAD
ORF3_14CSR     DRTTFTAKTYNYSFLNLTSDPTDIQTIKDRIPSDAEELNKDKLMYQFGATFTQKALMTAD
ORF3_670       DRTTFTAKTYNYSFLNLTSDPTDIQTIKDRIPSDAEELNKDKLMYQFGATFTQKALMTAD
ORF3_6BF       DRTTFTAKTYNYSFLNLTSDPTDIQTIKDRIPSDAEELNKDKLMYQFGATFTQKALMTAD
ORF3_6BSP      DRTTFTAKTYNYSFLNLTSDPTDIQTIKDRIPSDAEELNKDKLMYQFGATFTQKALMTAD
ORF3_19FTW     DQTSFTTNTKDYSYLKLTNDKNDIVELKNKVPTEAEDHDGNRLMYQFGATFTQKALMKAD
ORF3_9VSP      DQTSFTTNTKDYSYLKLTNDKNDIVELKNKVPTEAEDHDGNRLMYQFGATFTQKALMKAD
ORF3_23FTW     DQTSFTTNTKDYSYLKLTNDKNDIVELKNKVPTEAEDHDGNRLMYQFGATFTQKALMKAD
ORF3_TIGR      DQTSFTTNTKDYSYLKLTNDKNDIVELKNKVPTEAEDHDGNRLMYQFGATFTQKALMKAD
               *:*:**::* :**:*:**.* .**  :*:::*::**: : ::***************.**

ORF3_19AH      DILTKQARPNSKKVIFHITDGVPTMSYPINFKYTGTTQSYRTQLNNFKAKTPNSSGILLE
ORF3_23FP      DILTKQARPNSKKVIFHITDGVPTMSYPINFKYTGTTQSYRTQLNNFKAKTPNSSGILLE
ORF3_14CSR     DILTKQARPNSKKVIFHITDGVPTMSYPINFKYTGTTQSYRTQLNNFKAKTPNSSGILLE
ORF3_670       DILTKQARPNSKKVIFHITDGVPTMSYPINFKYTGTTQSYRTQLNNFKAKTPNSSGILLE
ORF3_6BF       DILTKQARPNSKKVIFHITDGVPTMSYPINFKYTGTTQSYRTQLNNFKAKTPNSSGILLE
ORF3_6BSP      DILTKQARPNSKKVIFHITDGVPTMSYPINFKYTGTTQSYRTQLNNFKAKTPNSSGILLE
ORF3_19FTW     EILTQQARQNSQKVIFHITDGVPTMSYPINFNHATFAPSYQNQLNAFFSKSPNKDGILLS
ORF3_9VSP      EILTQQARQNSQKVIFHITDGVPTMSYPINFNHATFAPSYQNQLNVFFSKSPNKDGILLS
ORF3_23FTW     EILTQQARQNSQKVIFHITDGVPTMSYPINFNHATFAPSYQNQLNVFFSKSPNKDGILLS
ORF3_TIGR      EILTQQARQNSQKVIFHITDGVPTMSYPINFNHATFAPSYQNQLNAFFSKSPNKDGILLS
               :***:*** **:*******************:::  : **:.*** * :*:**..****.

ORF3_19AH      DFVTWSADGEHKIVRGDGESYQMFTKKPVTDQYGVHQILSITSMEQRAKLVSAGYRFYGT
ORF3_23FP      DFVTWSADGEHKIVRGDGESYQMFTKKPVTDQYGVHQILSITSMEQRAKLVSAGYRFYGT
ORF3_14CSR     DFVTWSADGEHKIVRGDGESYQMFTKKPVTDQYGVHQILSITSMEQRAKLVSAGYRFYGT
ORF3_670       DFVTWSADGEHKIVRGDGESYQMFTKKPVTDQYGVHQILSITSMEQRAKLVSAGYRFYGT
ORF3_6BF       DFVTWSADGEHKIVRGDGESYQMFTKKPVTDQYGVHQILSITSMEQRAKLVSAGYRFYGT
ORF3_6BSP      DFVTWSADGEHKIVRGDGESYQMFTKKPVTDQYGVHQILSITSMEQRAKLVSAGYRFYGT
ORF3_19FTW     DFITQATSGEHTIVRGDGQSYQMFTDKTVYEK-GAPAAFPVK-PEKYSEMKAVGYAVIGD
ORF3_9VSP      DFITQATSGEHTIVRGDGQSYQMFTDKTVYEK-GAPAAFPVK-PEKYSEMKAVGYAVIGD
ORF3_23FTW     DFITQATSGEHTIVRGDGQSYQMFTDKTVYEK-GAPAAFPVK-PEKYSEMKAAGYAVIGD
ORF3_TIGR      DFITQATSGEHTIVRGDGQSYQMFTDKTVYEK-GAPAAFPVK-PEKYSEMKAAGYAVIGD
               **:* ::.***.******:******.*.* :: *.   :.:.  *: ::: :.** . *

ORF3_19AH      -----DLYLYWRDSILAYPFNSSTDWITNHGDPTTWYYNGNMAQDGYDVFTVGVGVNGDP
ORF3_23FP      -----DLYLYWRDSILAYPFNSSTDWITNHGDPTTWYYNGNMAQDGYDVFTVGVGVNGDP
ORF3_14CSR     -----DLYLYWRDSILAYPFNSSTDWITNHGDPTTWYYNGNMAQDGYDVFTVGVGVNGDP
ORF3_670       -----DLYLYWRDSILAYPFNSSTDWITNHGDPTTWYYNGNMAQDGYDVFTVGVGVNGDP
ORF3_6BF       -----DLYLYWRDSILAYPFNSSTDWITNHGDPTTWYYNGNMAQDGYDVFTVGVGVNGDP
ORF3_6BSP      -----DLYLYWRDSILAYPFNSSTDWITNHGDPTTWYYNGNMAQDGYDVFTVGVGVNGDP
ORF3_19FTW     PINGGYIWLNWRESILAYPFNSNTAKITNHGAPTRWYYNGNIAPDGYDVFTVGIGINGDP
ORF3_9VSP      PINGGYIWLNWRESILAYPFNSNTAKITNHGDPTRWYYNGNIAPDGYDVFTVGIGINGDP
ORF3_23FTW     PINGGYIWLNWRESILAYPFNSNTAKITNHGDPTRWYYNGNIAPDGYDVFTVGIGINGDP
ORF3_TIGR      PINGGYIWLNWRESILAYPFNSNTAKITNHGDPTRWYYNGNIAPDGYDVFTVGIGINGDP
                     ::* **:*********.*  ***** ** ******:* *********:*:****

ORF3_19AH      GTDEATATRFMQSISSSPDNYTNVADPSQILQELNRYFYTIVNEKKSIENGTITDPMGEL
ORF3_23FP      GTDEATATRFMQSISSSPDNYTNVADPSQILQELNRYFYTIVNEKKSIENGTITDPMGEL
ORF3_14CSR     GTDEATATRFMQSISSSPDNYTNVADPSQILQELNRYFYTIVNEKKSIENGTITDPMGEL
ORF3_670       GTDEATATRFMQSISSSPDNYTNVADPSQILQELNRYFYTIVNEKKSIENGTITDPMGEL
ORF3_6BF       GTDEATATRFMQSISSSPDNYTNVADPSQILQELNRYFYTIVNEKKSIENGTITDPMGEL
ORF3_6BSP      GTDEATATRFMQSISSSPDNYTNVADPSQILQELNRYFYTIVNEKKSIENGTITDPMGEL
ORF3_19FTW     GTDEATATSFMQSISSKPENYTNVTDTTKILEQLNRYFHTIVTEKKSIENGTITDPMGEL
ORF3_9VSP      GTDEATATSFMQSISSKPENYTNVTDTTKILEQLNRYFHTIVTEKKSIENGTITDPMGEL
ORF3_23FTW     GTDEATATSFMQSISSKPENYTNVTDTTKILEQLNRYFHTIVTEKKSIENGTITDPMGEL
ORF3_TIGR      GTDEATATSFMQSISSKPENYTNVTDTTKILEQLNRYFHTIVTEKKSIENGTITDPMGEL
               ******** *******.*:*****:*.::**::*****:***.*****************
```

Figure 142C

```
ORF3_19AH       IDFQLGADGRFDPADYTLTANDGSSLVNNVPTGGPQNDGGLLKNAKVFYDTTEKRIRVTG
ORF3_23FP       IDFQLGADGRFDPADYTLTANDGSSLVNNVPTGGPQNDGGLLKNAKVFYDTTEKRIRVTG
ORF3_14CSR      IDFQLGADGRFDPADYTLTANDGSSLVNNVPTGGPQNDGGLLKNAKVFYDTTEKRIRVTG
ORF3_670        IDFQLGADGRFDPADYTLTANDGSSLVNNVPTGGPQNDGGLLKNAKVFYDTTEKRIRVTG
ORF3_6BF        IDFQLGADGRFDPADYTLTANDGSSLVNNVPTGGPQNDGGLLKNAKVFYDTTEKRIRVTG
ORF3_6BSP       IDFQLGADGRFDPADYTLTANDGSSLVNNVPTGGPQNDGGLLKNAKVFYDTTEKRIRVTG
ORF3_19FTW      IDLQLGTDGRFDPADYTLTANDGSRLENGQAVGGPQNDGGLLKNAKVFYDTTEKRIRVTG
ORF3_9VSP       IDLQLGTDGRFDPADYTLTANDGSRLENGQAVGGPQNDGGLLKNAKVFYDTTEKRIRVTG
ORF3_23FTW      IDLQLGTDGRFDPADYTLTANDGSRLENGQAVGGPQNDGGLLKNAKVLYDTTEKRIRVTG
ORF3_TIGR       IDLQLGTDGRFDPADYTLTANDGSRLENGQAVGGPQNDGGLLKNAKVLYDTTEKRIRVTG
                **:***:***************** * *. ..***************:************

ORF3_19AH       LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRTTLHPKEVEKNTVRDFPIPKIRDVRKYP
ORF3_23FP       LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRTTLHPKEVEKNTVRDFPIPKIRDVRKYP
ORF3_14CSR      LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRTTLHPKEVEKNTVRDFPIPKIRDVRKYP
ORF3_670        LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRTTLHPKEVEKNTVRDFPIPKIRDVRKYP
ORF3_6BF        LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRTTLHPKEVEKNTVRDFPIPKIRDVRKYP
ORF3_6BSP       LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRTTLHPKEVEKNTVRDFPIPKIRDVRKYP
ORF3_19FTW      LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRTTLHPKEVEKNTVRDFPIPKIRDVRKYP
ORF3_9VSP       LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRTTLHPKEVEKNTVRDFPIPKIRDVRKYP
ORF3_23FTW      LYLGTDEKVTLTYNVRLNDEFVSNKFYDTNGRTTLHPKEVEQNTVRDFPIPKIRDVRKYP
ORF3_TIGR       LYLGTDEKVTLTYNVRLNDEFVSNKFYDTNGRTTLHPKEVEQNTVRDFPIPKIRDVRKYP
                *****.*************:*********************:******************

ORF3_19AH       EITIPKEKKLGEIEFIKINKNDKKPLRDAVFSLQKQHPDYPDIYGAIDQNGTYQNVRTGE
ORF3_23FP       EITIPKEKKLGEIEFIKINKNDKKPLRDAVFSLQKQHPDYPDIYGAIDQNGTYQNVRTGE
ORF3_14CSR      EITIPKEKKLGEIEFIKINKNDKKPLRDAVFSLQKQHPDYPDIYGAIDQNGTYQNVRTGE
ORF3_670        EITIPKEKKLGEIEFIKINKNDKKPLRDAVFSLQKQHPDYPDIYGAIDQNGTYQNVRTGE
ORF3_6BF        EITIPKEKKLGEIEFIKINKNDKKPLRDAVFSLQKQHPDYPDIYGAIDQNGTYQNVRTGE
ORF3_6BSP       EITIPKEKKLGEIEFIKINKNDKKPLRDAVFSLQKQHPDYPDIYGAIDQNGTYQNVRTGE
ORF3_19FTW      AITIAKEKKLGEIEFIKINKNDKKPLRDAVFSLQKQHPDYPDIYGAIDQNGTYQNVRTGE
ORF3_9VSP       AITIAKEKKLGEIEFIKINKNDKKPLRDAVFSLQKQHPDYPDIYGAIDQNGTYQNVRTGE
ORF3_23FTW      EITISKEKKLGDIEFIKVNKNDKKPLRDAVFSLQKQHPDYPDIYGAIDQNGTYQNVRTGE
ORF3_TIGR       EITISKEKKLGDIEFIKVNKNDKKPLRGAVFSLQKQHPDYPDIYGAIDQNGTYQNVRTGE
                 ***.******:*****:*********.********************************

ORF3_19AH       DGKLTFKNLSDGKYRLFENSEPAGYKPVQNKPIVAFQIVNGEVRDVTSIVPQDIPAGYEF
ORF3_23FP       DGKLTFKNLSDGKYRLFENSEPAGYKPVQNKPIVAFQIVNGEVRDVTSIVPQDIPAGYEF
ORF3_14CSR      DGKLTFKNLSDGKYRLFENSEPAGYKPVQNKPIVAFQIVNGEVRDVTSIVPQDIPAGYEF
ORF3_670        DGKLTFKNLSDGKYRLFENSEPAGYKPVQNKPIVAFQIVNGEVRDVTSIVPQDIPAGYEF
ORF3_6BF        DGKLTFKNLSDGKYRLFENSEPAGYKPVQNKPIVAFQIVNGEVRDVTSIVPQDIPAGYEF
ORF3_6BSP       DGKLTFKNLSDGKYRLFENSEPAGYKPVQNKPIVAFQIVNGEVRDVTSIVPQDIPAGYEF
ORF3_19FTW      DGKLTFKNLSDGKYRLFENSEPAGYKPVQNKPIVAFQIVNGEVRDVTSIVPQDIPAGYEF
ORF3_9VSP       DGKLTFKNLSDGKYRLFENSEPAGYKPVQNKPIVAFQIVNGEVRDVTSIVPQDIPAGYEF
ORF3_23FTW      DGKLTFKNLSDGKYRLFENSEPAGYKPVQNKPIVAFQIVNGEVRDVTSIVPQDIPAGYEF
ORF3_TIGR       DGKLTFKNLSDGKYRLFENSEPAGYKPVQNKPIVAFQIVNGEVRDVTSIVPQDIPAGYEF
                ************************************************************

ORF3_19AH       TNDKHYITNEPIPPKREYPRTGGIGMLPFYLIGCMMMGGVLLYTRKNP
ORF3_23FP       TNDKHYITNEPIPPKREYPRTGGIGMLPFYLIGCMMMGGVLLYTRKNP
ORF3_14CSR      TNDKHYITNEPIPPKREYPRTGGIGMLPFYLIGCMMMGGVLLYTRKHP
ORF3_670        TNDKHYITNEPIPPKREYPRTGGIGMLPFYLIGCMMMGGVLLYTRKHP
ORF3_6BF        TNDKHYITNEPIPPKREYPRTGGIGMLPFYLIGCMMMGGVLLYTRKHP
ORF3_6BSP       TNDKHYITNEPIPPKREYPRTGGIGMLPFYLIGCMMMGGVLLYTRKHP
ORF3_19FTW      TNDKHYITNEPIPPKREYPRTGGIGMLPFYLIGCMMMGGVLLYTRKHP
ORF3_9VSP       TNDKHYITNEPIPPKREYPRTGGIGMLLFYLIGCMMMGGVLLYTRKHP
ORF3_23FTW      TNDKHYITNEPIPPKREYPRTGGIGMLPFYLIGCMMMGGVLLYTRKHP
ORF3_TIGR       TNDKHYITNEPIPPKREYPRTGGIGMLPFYLIGCMMMGGVLLYTRKHP
                *************************** ******************:*
```

Figure 143A

```
ORF4_6BF        MKSINKFLTMLAALLLTASSLFSAATVFAADNVSTAPDAVTKTLTIHKLLLSEDDLKTWD
ORF4_6BSP       MKSINKFLTMLAALLLTASSLFSAATVFAADNVSTAPDAVTKTLTIHKLLLSEDDLKTWD
ORF4_670        MKSINKFLTMLAALLLTASSLFSAATVFAADNVSTAPDAVTKTLTIHKLLLSEDDLKTWD
ORF4_14CSR      MKSINKFLTMLAALLLTASSLFSAATVFAADNVSTAPDAVTKTLTIHKLLLSEDDLKTWD
ORF4_19AH       MKSINKFLTMLAALLLTASSLFSAATVFAADNVSTAPDAVTKTLTIHKLLLSEDDLKTWD
ORF4_23FP       MKSINKFLTMLAALLLTASSLFSAATVFAADNVSTAPDAVTKTLTIHKLLLSEDDLKTWD
ORF4_23FTW      MKSINKFLTILAALLLTVSSLFSAATVFAAEQK-------TKTLTVHKLLMTDQELDAWN
ORF4_19FTW      MKSINKFLTMLAALLLTASSLFSAATVFAAGTT-------TTSVTVHKLLATDGDMDKIA
ORF4_9VSP       MKSINKFLTMLAALLLTASSLFSAATVFAAGTT-------TTSVTVHKLLATDGDMDKIA
ORF4_TIGR       MKSINKFLTMLAALLLTASSLFSAATVFAAGTT-------TTSVTVHKLLATDGDMDKIA
                *********:*******.************          *.::*:**** :: ::.

ORF4_6BF        TNGPK--GYDGTQ-----SSLKDLTGVVA--EEIPNVYFELQKYNLTDGKEKENLKDD-S
ORF4_6BSP       TNGPK--GYDGTQ-----SSLKDLTGVVA--EEIPNVYFELQKYNLTDGKEKENLKDD-S
ORF4_670        TNGPK--GYDGTQ-----SSLKDLTGVVA--EEIPNVYFELQKYNLTDGKEKENLKDD-S
ORF4_14CSR      TNGPK--GYDGTQ-----SSLKDLTGVVA--EEIPNVYFELQKYNLTDGKEKENLKDD-S
ORF4_19AH       TNGPK--GYDGTQ-----SSLKDLTGVVA--EEIPNVYFELQKYNLTDGKEKENLKDD-S
ORF4_23FP       TNGPK--GYDGTQ-----SSLKDLTGVVA--EEIPNVYFELQKYNLTDGKEKENLKDD-S
ORF4_23FTW      SDAITTAGYDGSQN---FEQFKQLQGVPQGVTEISGVAFELQSYTGPQGKEQENLTND-A
ORF4_19FTW      NELETG-NYAGNKVGVLPANAKEIAGVMFVWTNTNNEIIDENGQTLGVNIDPQTFKLSGA
ORF4_9VSP       NELETG-NYAGNKVGVLPANAKEIAGVMFVWTNTNNEIIDENGQTLGVNIDPQTFKLSGA
ORF4_TIGR       NELETG-NYAGNKVGVLPANAKEIAGVMFVWTNTNNEIIDENGQTLGVNIDPQTFKLSGA
                .:  .  .* *.:      . *:: **     :  .  :: :  .   . : :.:. . :

ORF4_6BF        KWTTVHGGLTTKDGLKIETSTLKG-VYRIREDRTKTTYVGPNGQVLTGSKAVPALVTLPL
ORF4_6BSP       KWTTVHGGLTTKDGLKIETSTLKG-VYRIREDRTKTTYVGPNGQVLTGSKAVPALVTLPL
ORF4_670        KWTTVHGGLTTKDGLKIETSTLKG-VYRIREDRTKTTYVGPNGQVLTGSKAVPALVTLPL
ORF4_14CSR      KWTTVHGGLTTKDGLKIETSTLKG-VYRIREDRTKTTYVGPNGQVLTGSKAVPALVTLPL
ORF4_19AH       KWTTVHGGLTTKDGLKIETSTLKG-VYRIREDRTKTTYVGPNGQVLTGSKAVPALVTLPL
ORF4_23FP       KWTTVHGGLTTKDGLKIETSTLKG-VYRIREDRTKTTYVGPNGQVLTGSKAVPALVTLPL
ORF4_23FTW      VWTAVNKGVTTETGVKFDTEVLQG-TYRLVEVRKESTYVGPNGKVLTGMKAVPALITLPL
ORF4_19FTW      MPATAMKKLTEAEGAKFNTANLPAAKYKIYEIHSLSTYVGEDGATLTGSKAVPIEIELPL
ORF4_9VSP       MPATAMKKLTEAEGAKFNTANLPAAKYKIYEIHSLSTYVGEDGATLTGSKAVPIEIELPL
ORF4_TIGR       MPATAMKKLTEAEGAKFNTANLPAAKYKIYEIHSLSTYVGEDGATLTGSKAVPIEIELPL
                  ::.   :*   * *::*  * .  *:: * :. :**** :* .*** ****  : ***

ORF4_6BF        VNNNGTVIDAHVFPKNSYNKPVVDKRIADTLNYND-------QNGLSIGTKIPYVVNTTI
ORF4_6BSP       VNNNGTVIDAHVFPKNSYNKPVVDKRIADTLNYND-------QNGLSIGTKIPYVVNTTI
ORF4_670        VNNNGTVIDAHVFPKNSYNKPVVDKRIADTLNYND-------QNGLSIGTKIPYVVNTTI
ORF4_14CSR      VNNNGTVIDAHVFPKNSYNKPVVDKRIADTLNYND-------QNGLSIGTKIPYVVNTTI
ORF4_19AH       VNNNGTVIDAHVFPKNSYNKPVVDKRIADTLNYND-------QNGLSIGTKIPYVVNTTI
ORF4_23FP       VNNNGTVIDAHVFPKNSYNKPVVDKRIADTLNYND-------QNGLSIGTKIPYVVNTTI
ORF4_23FTW      VNQNGVVENAHVYPKNSEDKPTATKTFDTAAGFVDP-----GEKGLAIGTKVPYIVTTTI
ORF4_19FTW      ND----VVDAHVYPKNTEAKPKIDKDFKGKANPDTPRVDKDTPVNHQVGDVVEYEIVTKI
ORF4_9VSP       ND----VVDAHVYPKNTEAKPKIDKDFKGKANPDTPRVDKDTPVNHQVGDVVEYEIVTKI
ORF4_TIGR       ND----VVDAHVYPKNTEAKPKIDKDFKGKANPDTPRVDKDTPVNHQVGDVVEYEIVTKI
                 :    * :***:***:  **   * :    .            .  :*  : * : *.*

ORF4_6BF        PSNATFATSFWSDEMTEGLTYN-EDVTITLNNVAMDQADYEVTKGNNGFNLKLTEAGLAK
ORF4_6BSP       PSNATFATSFWSDEMTEGLTYN-EDVTITLNNVAMDQADYEVTKGNNGFNLKLTEAGLAK
ORF4_670        PSNATFATSFWSDEMTEGLTYN-EDVTITLNNVAMDQADYEVTKGNNGFNLKLTEAGLAK
ORF4_14CSR      PSNATFATSFWSDEMTEGLTYN-EDVTITLNNVAMDQADYEVTKGNNGFNLKLTEAGLAK
ORF4_19AH       PSNATFATSFWSDEMTEGLTYN-EDVTITLNNVAMDQADYEVTKGXNGFNLKLTEAGLAK
ORF4_23FP       PSNATFATSFWSDEMTEGLTYN-EDVTITLNNVAMDQADYEVTKGINGFNLKLTEAGLAK
ORF4_23FTW      PKNSTLATAFWSDEMTEGLDYN-GDVVVNYNGQPLDNSHYTLEAGHNGFILKLNEKGLEA
ORF4_19FTW      PALANYATANWSDRMTEGLAFNKGTVKVTVDDVALEAGDYALTEVATGFDLKLTDAGLAK
ORF4_9VSP       PALANYATANWSDRMTEGLAFNKGTVKVTVDDVALEAGDYALTEVATGFDLKLTDAGLAK
ORF4_TIGR       PALANYATANWSDRMTEGLAFNKGTVKVTVDDVALEAGDYALTEVATGFDLKLTDAGLAK
                *  :. **: ***.***** :*   * :. :. .:: ..* :    .** ***.: **
```

Figure 143B

```
ORF4_6BF            INGKDADQKIQITYSATLNSLAVADIPESNDITYHYGNHQDHGNTPKPTKPN-NGQITVT
ORF4_6BSP           INGKDADQKIQITYSATLNSLAVADIPESNDITYHYGNHQDHGNTPKPTKPN-NGQITVT
ORF4_670            INGKDADQKIQITYSATLNSLAVADIPESNDITYHYGNHQDHGNTPKPTKPN-NGQITVT
ORF4_14CSR          INGKDADQKIQITYSATLNSLAVADIPESNDITYHYGNHQDHGNTPKPTKPN-NGQITVT
ORF4_19AH           INGKDADQKIQITYSATLNSLAVADIPESNDITYHYGNHQDHGNTPKPTKPN-NGQITVT
ORF4_23FP           INGKDADQKIQITYSATLNSLAVADIPESNDITYHYGNHQDHGNTPKPTKPN-NGQITVT
ORF4_23FTW          INGKDAEATITLKYTATLNALAVADVPEANDVTFHYGNNPGHGNTPKPNKPK-NGELTIT
ORF4_19FTW          VNDQNAEKTVKITYSATLNDKAIVEVPESNDVTFNYGNNPDHGNTPKPNKPNENGDLTLT
ORF4_9VSP           VNDQNAEKTVKITYSATLNDKAIVEVPESNDVTFNYGNNPDHGNTPKPNKPNENGDLTLT
ORF4_TIGR           VNDQNAEKTVKITYSATLNDKAIVEVPESNDVTFNYGNNPDHGNTPKPNKPNENGDLTLT
                    :*.::*: .: :.*:****  *:.::**:**:*::***: .*******.**: **::*:*

ORF4_6BF            KTWDSQPAP---EGVKATVQLVNAKTGEKVGAP------VELSENNWTYTWSGLDNSIEY
ORF4_6BSP           KTWDSQPAP---EGVKATVQLVNAKTGEKVGAP------VELSENNWTYTWSGLDNSIEY
ORF4_670            KTWDSQPAP---EGVKATVQLVNAKTGEKVGAP------VELSENNWTYTWSGLDNSIEY
ORF4_14CSR          KTWDSQPAP---EGVKATVQLVNAKTGEKVGAP------VELSENNWTYTWSGLDNSIEY
ORF4_19AH           KTWDSQPAP---EGVKATVQLVNAKTGEKVGAP------VELSENNWTYTWSGLDNSIEY
ORF4_23FP           KTWDSQPAP---EGVKATVQLVNAKTGEKVGAP------VELSENNWTYTWSGLDNSIEY
ORF4_23FTW          KTWADAKDAPI-AGVEVTFDLVNAQTGEVVKVPGHETGIVLNQTNNWTFTATGLDNNTEY
ORF4_19FTW          KTWVDATGAPIPAGAEATFDLVNAQTGKVVQTV-------TLTTDKNTVTVNGLDKNTEY
ORF4_9VSP           KTWVDATGAPIPAGAEATFDLVNAQTGKVVQTV-------TLTTDKNTVTVNGLDKNTEY
ORF4_TIGR           KTWVDATGAPIPAGAEATFDLVNAQTGKVVQTV-------TLTTDKNTVTVNGLDKNTEY
                    *** .   .    *.:.*.:****:**: * .            :: * * .***:. **

ORF4_6BF            K-VEEEYNGYSAEY-TVESKGKLGVKNWKDNNPAPINPEEPRVKTYGKKFVKVDQKDTRL
ORF4_6BSP           K-VEEEYNGYSAEY-TVESKGKLGVKNWKDNNPAPINPEEPRVKTYGKKFVKVDQKDTRL
ORF4_670            K-VEEEYNGYSAEY-TVESKGKLGVKNWKDNNPAPINPEEPRVKTYGKKFVKVDQKDTRL
ORF4_14CSR          K-VEEEYNGYSAEY-TVESKGKLGVKNWKDNNPAPINPEEPRVKTYGKKFVKVDQKDTRL
ORF4_19AH           K-VEEEYNGYSAEY-TVESKGKLGVKNWKDNNPAPINPEEPRVKTYGKKFVKVDQKDTRL
ORF4_23FP           K-VEEEYNGYSAEY-TVESKGKLGVKNWKDNNPAPINLEEPRVKTYGKKFVKVDQKDTRL
ORF4_23FTW          KFVERTIKGYSADYQTITETGKIAVKNWKDENPEPINPEEPRVKTYGKKFVKVDQKDERL
ORF4_19FTW          KFVERSIKGYSADYQEITTAGEIAVKNWKDENPKPLDPTEPKVVTYGKKFVKVNDKDNRL
ORF4_9VSP           KFVERSIKGYSADYQEITTAGEIAVKNWKDENPKPLDPTEPKVVTYGKKFVKVNDKDNRL
ORF4_TIGR           KFVERSIKGYSADYQEITTAGEIAVKNWKDENPKPLDPTEPKVVTYGKKFVKVNDKDNRL
                    * **.  :****:*  :   *::.******:** *::  **:* *********::** **

ORF4_6BF            ENAQFVVKKADSN-KYIAFKSTAQQAADEKAAATAKQKLDAAVAAY---TNAADKQAAQA
ORF4_6BSP           ENAQFVVKKADSN-KYIAFKSTAQQAADEKAAATAKQKLDAAVAAY---TNAADKQAAQA
ORF4_670            ENAQFVVKKADSN-KYIAFKSTAQQAADEKAAATAKQKLDAAVAAY---TNAADKQAAQA
ORF4_14CSR          ENAQFVVKKADSN-KYIAFKSTAQQAADEKAAATAKQKLDAAVAAY---TNAADKQAAQA
ORF4_19AH           ENAQFVVKKADSN-KYIAFKSTAQQAADEKAAATAKQKLDAAVAAY---TNAADKQAAQA
ORF4_23FP           ENAQFVVKKADSN-KYIAFKSTAQQAADEKAAATAKQKLDAAVAAY---TNAADKQAAQA
ORF4_23FTW          KEAQFVVKNEQG--KYLALKSAAQQAVNEKAAAEAKQALDAAIAAY---TNAADKNAAQA
ORF4_19FTW          AGAEFVIANADNAGQYLARKADKVSQEEKQLVVTTKDALDRAVAAYNALTAQQQTQQEKE
ORF4_9VSP           AGAEFVIANADNAGQYLARKADKVSQEEKQLVVTTKDALDRAVAAYNALTAQQQTQQEKE
ORF4_TIGR           AGAEFVIANADNAGQYLARKADKVSQEEKQLVVTTKDALDRAVAAYNALTAQQQTQQEKE
                      *:**: : :.  :*:* *:   .  ::: .. :*: ** *:***   *   :.:  :

ORF4_6BF            LVDQAQQEYNVAYKEAKFGYVEVAGKDE--AMVLTSNTDGQFQISGLAAGTYKLEEIKAE
ORF4_6BSP           LVDQAQQEYNVAYKEAKFGYVEVAGKDE--AMVLTSNTDGQFQISGLAAGTYKLEEIKAE
ORF4_670            LVDQAQQEYNVAYKEAKFGYVEVAGKDE--AMVLTSNTDGQFQISGLAAGTYKLEEIKAE
ORF4_14CSR          LVDQAQQEYNVAYKEAKFGYVEVAGKDE--AMVLTSNTDGQFQISGLAAGTYKLEEIKAE
ORF4_19AH           LVDQAQQEYNVAYKEAKFGYVEVAGKDE--AMVLTSNTDGQFQISGLAAGTYKLEEIKAE
ORF4_23FP           LVDQAQQEYNVAYKEAKFGYVEVAGKDE--AMVLTSNTDGQFQISGLAAGTYKLEEIKAE
ORF4_23FTW          VVDAAQKTYNDNYRAARFGYVEVERKED--ALVLTSNTDGQFQISGLAAGSYTLEETKAE
ORF4_19FTW          KVDKAQAAYNAAVIAANNAFEWVADKDNENVVKLVSDAQGRFEITGLLAGTYYLEETKQE
ORF4_9VSP           KVDKAQAAYNAAVIAANNAFEWVADKDNENVVKLVSDAQGRFEITGLLAGTYYLEETKQE
ORF4_TIGR           KVDKAQAAYNAAVIAANNAFEWVADKDNENVVKLVSDAQGRFEITGLLAGTYYLEETKQE
                     ** **  **     *. .:  *  *::  .: *.*:::*:*:*:** **:* *** * *
```

Figure 143C

```
ORF4_6BF        EGEAKIDD-VEFVVGAGSWNQG--EFNYLKDVQKNDATKVVNKKITLPQTGGIGTIIFAV
ORF4_6BSP       EGEAKIDD-VEFVVGAGSWNQG--EFNYLKDVQKNDATKVVNKKITLPQTGGIGTIIFAV
ORF4_670        EGEAKIDD-VEFVVGAGSWNQG--EFNYLKDVQKNDATKVVNKKITLPQTGGIGTIIFAV
ORF4_14CSR      EGEAKIDD-VEFVVGAGSWNQG--EFNYLKDVQKNDATKVVNKKITLPQTGGIGTIIFAV
ORF4_19AH       EGEAKIDD-VEFVVGAGSWNQG--EFNYLKDVQKNDATKVVNKKITLPQTGGIGTIIFAV
ORF4_23FP       EGEAKIDD-VEFVVGAGSWNQG--EFNYLKDVQKNDATKVVNKKITLPQTGGIGTIIFAV
ORF4_23FTW      EGEAKLGD-VKFEVGAGSWNQG--DFNYLKDVQKNDATKVVNKKITLPQTGGIGTIIFAV
ORF4_19FTW      AGYALLTSRQKFEVTATSYSATGQGIEYTAGSGKDDATKVVNKKITLPQTGGIGTIIFAV
ORF4_9VSP       AGYALLTSRQKFEVTATSYSATGQGIEYTAGSGKDDATKVVNKKITLPQTGGIGTIIFAV
ORF4_TIGR       AGYALLTSRQKFEVTATSYSATGQGIEYTAGSGKDDATKVVNKKITLPQTGGIGTIIFAV
                 *:* : .  :* * * *:.     ::*  .  *:*************************

ORF4_6BF        AGAAIMGIAVYAYVKNNKDEDQLA
ORF4_6BSP       AGAAIMGIAVYAYVKNNKDEDQLA
ORF4_670        AGAAIMGIAVYAYVKNNKDEDQLA
ORF4_14CSR      AGAAIMGIAVYAYVKNNKDEDQLA
ORF4_19AH       AGAAIMGIAVYAYVKNNKDEDQLA
ORF4_23FP       AGAVIMGIAVYAYVKNNKDEDQLA
ORF4_23FTW      AGAVIMGIAVYAYVKNNKDEDQLA
ORF4_19FTW      AGAVIMGIAVYAYVKNNKDEDQLA
ORF4_9VSP       AGAVIMGIAVYAYVKNNKDEDQLA
ORF4_TIGR       AGAAIMGIAVYAYVKNNKDEDQLA
                ***.********************
```

Figure 144A

```
ORF5_6BSP      ------------MTMQKMQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV
ORF5_TIGR      ------------MTMQKMQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV
ORF5_6BF       ------------MTMQKMQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV
ORF5_670       ------------MTMQKMQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV
ORF5_19AH      ------------MTMQKMQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV
ORF5_14CSR     ------------MTMQKMQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV
ORF5_19FTW     ------------MTMQKMQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV
ORF5_23FTW     ------------MTMQKMQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV
ORF5_9VSP      MTMQKMQKMQKMQKMQKMQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV
ORF5_23FP      ------------MTMQKMQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV
                           .***********************************************

ORF5_6BSP      VSQLPSRDGHRLQVWKLDDSYSYDDRVQIVRDLHSWDENKLSSFKKTSFEMTFLENQIEV
ORF5_TIGR      VSQLPSRDGHRLQVWKLDDSYSYDDRVQIVRDLHSWDENKLSSFKKTSFEMTFLENQIEV
ORF5_6BF       VSQLPSRDGHRLQVWKLDDSYSYDDRVQIVRDLHSWDENKLSSFKKTSFEMTFLENQIEV
ORF5_670       VSQLPSRDGHRLQVWKLDDSYSYDDRVQIVRDLHSWDENKLSSFKKTSFEMTFLENQIEV
ORF5_19AH      VSQLPSRDGHRLQVWKLDDSYSYDDRVQIVRDLHSWDENKLSSFKKTSFEMTFLENQIEV
ORF5_14CSR     VSQLPSRDGHRLQVWKLDDSYSYDDRVQIVRDLHSWDENKLSSFKKTSFEMTFLENQIEV
ORF5_19FTW     VSQLPSRDGHRLQVWKLDDSYSYDNRVQIVRDLHSWDENKLSSFKKTSFEMTFLENQIEV
ORF5_23FTW     VSQLPSRDGHRLQVWKLDDSYSYDNRVQIVRDLHSWDENKLSSFKKTSFEMTFLENQIEV
ORF5_9VSP      VSQLPSRDGHRLQVWKLDDSYSYDNRVQIVRDLHSWDENKLSSFKKTSFEMTFLENQIEV
ORF5_23FP      VSQLPSRDGHRLQVWKLDDSYSYDNRVQIVRDLHSWDENKLSSFKKTSFEMTFLENQIEV
               ************************:***********************************

ORF5_6BSP      SHIPNGLYYVRSIIQTDAVSYPAEFLFEMTDQTVEPLVIVAKKTDTMTTKVKLIKVDQDH
ORF5_TIGR      SHIPNGLYYVRSIIQTDAVSYPAEFLFEMTDQTVEPLVIVAKKTDTMTTKVKLIKVDQDH
ORF5_6BF       SHIPNGLYYVRSIIQTDAVSYPAEFLFEMTDQTVEPLVIVAKKTDTMTTKVKLIKVDQDH
ORF5_670       SHIPNGLYYVRSIIQTDAVSYPAEFLFEMTDQTVEPLVIVAKKTDTMTTKVKLIKVDQDH
ORF5_19AH      SHIPNGLYYVRSIIQTDAVSYPAEFLFEMTDQTVEPLVIVAKKTDTMTTKVKLIKVDQDH
ORF5_14CSR     SHIPNGLYYVRSIIQTDAVSYPAEFLFEMTDQTVEPLVIVAKKTDTMTTKVKLIKVDQDH
ORF5_19FTW     SHIPNGLYYVRSIIQTDAVSYPAEFLFEMTDQTVEPLVIVAKKADTVTTKVKLIKVDQDH
ORF5_23FTW     SHIPNGLYYVRSIIQTDAVSYPAEFLFEMTDQTVEPLVIVAKKADTVTTKVKLIKVDQDH
ORF5_9VSP      SHIPNGLYYVRSIIQTDAVSYPAEFLFEMTDQTVEPLVIVAKKADTVTTKVKLIKVDQDH
ORF5_23FP      SHIPNGLYYVRSIIQTDAVSYPAEFLFEMTDQTVEPLVIVAKKADTVTTKVKLIKVDQDH
               *******************************************:**:*************

ORF5_6BSP      NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRTLYTDKNGEIFVTNLPLGNYRF
ORF5_TIGR      NRLEGVGFKLVSVARDVSEKEVPLIGEYRYSSSGQVGRTLYTDKNGEIFVTNLPLGNYRF
ORF5_6BF       NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRTLYTDKNGEIFVTNLPLGNYRF
ORF5_670       NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRTLYTDKNGEIFVTNLPLGNYRF
ORF5_19AH      NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRTLYTDKNGEIFVTNLPLGNYRF
ORF5_14CSR     NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRTLYTDKNGEIFVTNLPLGNYRF
ORF5_19FTW     NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRTLYTDKNGEIVVTNLPLGTYRF
ORF5_23FTW     NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRTLYTDKNGEIVVTNLPLGTYRF
ORF5_9VSP      NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRTLYTDKNGEIVVTNLPLGTYRF
ORF5_23FP      NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRTLYTDKNGEIVVTNLPLGTYRF
               **************** ******************************.*******.****

ORF5_6BSP      KEVEPLAGYAVTTLDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV
ORF5_TIGR      KEVEPLAGYAVTTLDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV
ORF5_6BF       KEVEPLAGYAVTTLDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV
ORF5_670       KEVEPLAGYAVTTLDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV
ORF5_19AH      KEVEPLAGYAVTTLDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV
ORF5_14CSR     KEVEPLAGYAVTTLDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV
ORF5_19FTW     KEVEPLAGYTVTTMDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV
ORF5_23FTW     KEVEPLAGYTVTTMDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV
ORF5_9VSP      KEVEPLAGYTVTTMDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV
ORF5_23FP      KEVEPLAGYAVTTMDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV
               *********:***:**********************************************
```

Figure 144B

```
ORF5_6BSP      MKEESGHYTPVLQNGKEVVVTSGKDGRFRVEGLEYGTYLWELQAPTGYVQLTSPVSFTI
ORF5_TIGR      MKEESGHYTPVLQNGKEVVVTSGKDGRFRVEGLEYGTYLWELQAPTGYVQLTSPVSFTI
ORF5_6BF       MKEESGHYTPVLQNGKEVVVTSGKDGRFRVEGLEYGTYLWELQAPTGYVQLTSPVSFTI
ORF5_670       MKEESGHYTPVLQNGKEVVVTSGKDGRFRVEGLEYGTYLWELQAPTGYVQLTSPVSFTI
ORF5_19AH      MKEESGHYTPVLQNGKEVVVTSGKDGRFRVEGLEYGTYLWELQAPTGYVQLTSPVSFTI
ORF5_14CSR     MKEESGHYTPVLQNGKEVVVTSGKDGRFRVEGLEYGTYLWELQAPTGYVQLTSPVSFTI
ORF5_19FTW     MKEENGHYTPVLQNGKEVVVASGKDGRFRVEGLEYGTYLWELQAPTGYVQLTSPVSFTI
ORF5_23FTW     MKEENGHYTPVLQNGKEVVVASGKDGRFRVEGLEYGTYLWELQAPTGYVQLTSPVSFTI
ORF5_9VSP      MKEENGHYTPVLQNGKEVVVASGKDGRFRVEGLEYGTYLWELQAPTGYVQLTSPVSFTI
ORF5_23FP      MKEENGHYTPVLQNGKEVVVASGKDGRFRVEGLEYGTYLWELQAPTGYVQLTSPVSFTI
               ****.***************:**************************************

ORF5_6BSP      GKDTRKELVTVVKNNKRPRIDVPDTGEETLYILMLVAILLFGSGYYLTKKPNN
ORF5_TIGR      GKDTRKELVTVVKNNKRPRIDVPDTGEETLYILMLVAILLFGSGYYLTKKPNN
ORF5_6BF       GKDTRKELVTVVKNNKRPRIDVPDTGEETLYILMLVAILLFGSGYYLTKKPNN
ORF5_670       GKDTRKELVTVVKNNKRPRIDVPDTGEETLYILMLVAILLFGSGYYLTKKPNN
ORF5_19AH      GKDTRKELVTVVKNNKRPRIDVPDTGEETLYILMLVAILLFGSGYYLTKKPNN
ORF5_14CSR     GKDTRKELVTVVKNNKRPRIDVPDTGEETLYILMLVAILLFGSGYYLTKKPNN
ORF5_19FTW     GKDTRKELVTVVKNNKRPRIDVPDTGEETLYILMLVAILLFGSGYYLTKKTNN
ORF5_23FTW     GKDTRKELVTVVKNNKRPRIDVPDTGEETLYILMLVAILLFGSGYYLTKKTNN
ORF5_9VSP      GKDTRKELVTVVKNNKRPRIDVPDTGEETLYILMLVAILLFGSGYYLTKKTNN
ORF5_23FP      GKDTRKELVTVVKNNKRPRIDVPDTGEETLYILMLVAILLFGSGYYLTKKTNN
               **************************************************.**
```

Figure 145A

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ORF6_23FTW      MLIKMVKTKKQKRNNLLLGVVFFIGMAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_TIGR       MLIKMVKTKKQKRNNLLLGVVFFIGMAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_6BSP       MLIKMVKTKKQKRNNLLLGVVFFIGMAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_6BF        MLIKMVKTKKQKRNNLLLGVVFFIGMAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_670        MLIKMVKTKKQKRNNLLLGVVFFIGMAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_19AH       MLIKMVKTKKQKRNNLLLGVVFFIGMAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_14CSR      MLIKMVKTKKQKRNNLLLGVVFFIGMAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_23FP       MLIKMAKTKKQKRNNLLLGVVFFIGIAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_9VSP       MLIKMAKTKKQKRNNLLLGVVFFIGIAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_19FTW      MLIKMAKTKKQKRNNLLLGVVFFIGMAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
                *****.*******************:**********************************

ORF6_23FTW      DIDERMKLAQAFNDSLNNVVSGDPWSEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_TIGR       DIDERMKLAQAFNDSLNNVVSGDPWSEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_6BSP       DIDERMKLAQAFNDSLNNVVSGDPWSEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_6BF        DIDERMKLAQAFNDSLNNVVSGDPWSEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_670        DIDERMKLAQAFNDSLNNVVSGDPWSEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_19AH       DIDERMKLAQAFNDSLNNVVSGDPWSEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_14CSR      DIDERMKLAQAFNDSLNNVVSGDPWSEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_23FP       DIDERMKLAQAFNDSLNNVVSGDPWSEEMKKKGRAEYARMLEIHERMGHVEIPAIDVDLP
ORF6_9VSP       DIDERMKLAQAFNDSLNNVVSGDPWSEEMKKKGRAEYARMLEIHERMGHVEIPAIDVDLP
ORF6_19FTW      DIDERMKLAQAFNDSLNNVVSGDPWSEEMKKKGRAEYARMLEIHERMGHVEIPAIDVDLP
                *****************************************************.******

ORF6_23FTW      VYAGTAEEVLQQGAGQLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLKVGDKFYVH
ORF6_TIGR       VYAGTAEEVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLKVGDKFYVH
ORF6_6BSP       VYAGTAEEVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLKVGDKFYVH
ORF6_6BF        VYAGTAEEVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLKVGDKFYVH
ORF6_670        VYAGTAEEVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLKVGDKFYVH
ORF6_19AH       VYAGTAEEVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLKVGDKFYVH
ORF6_14CSR      VYAGTAEEVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLKVGDKFYVH
ORF6_23FP       VYAGTAEEVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLKVGDKFYVH
ORF6_9VSP       VYAGTAEEVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLKVGDKFYVH
ORF6_19FTW      VYAGTAEEVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLKVGDKFYVH
                ***************:********************************************

ORF6_23FTW      NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLLTCTPYMINTHRLLVRGHRIPYVAE
ORF6_TIGR       NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLLTCTPYMINTHRLLVRGHRIPYVAE
ORF6_6BSP       NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLLTCTPYMINTHRLLVRGHRIPYVAE
ORF6_6BF        NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLLTCTPYMINTHRLLVRGHRIPYVAE
ORF6_670        NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLLTCTPYMINTHRLLVRGHRIPYVAE
ORF6_19AH       NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLLTCTPYMINTHRLLVRGHRIPYVAE
ORF6_14CSR      NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLLTCTPYMINTHRLLVRGHRIPYVAE
ORF6_23FP       NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLLTCTPYMINTHRLLVRGHRIPYVAE
ORF6_9VSP       NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLLTCTPYMINTHRLLVRGHRIPYVAE
ORF6_19FTW      NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLLTCTPYMINTHRLLVRGHRIPYVAE
                ************************************************************

ORF6_23FTW      VEEEFIAANKLSHLYRYLFYVAVGLIVILLWIIRRLRKKKKQPEKALKALKAARKEVKVE
ORF6_TIGR       VEEEFIAANKLSHLYRYLFYVAVGLIVILLWIIRRLRKKKKQPEKALKALKAARKEVKVE
ORF6_6BSP       VEEEFIAANKLSHLYRYLFYVAVGLIVILLWIIRRLRKKKKQPEKALKALKAARKEVKVE
ORF6_6BF        VEEEFIAANKLSHLYRYLFYVAVGLIVILLWIIRRLRKKKKQPEKALKALKAARKEVKVE
ORF6_670        VEEEFIAANKLSHLYRYLFYVAVGLIVILLWIIRRLRKKKKQPEKALKALKAARKEVKVE
ORF6_19AH       VEEEFIAANKLSHLYRYLFYVAVGLIVILLWIIRRLRKKKKQPEKALKALKAARKEVKVE
ORF6_14CSR      VEEEFIAANKLSHLYRYLFYVAVGLIVILLWIIRRLRKKKKQPEKALKALKAARKEVKVE
ORF6_23FP       VEEEFIAANKLSHLYRYLFYVAVGLIVILLWIIRRLRKKKRQSERALKALKEATKEVKVE
ORF6_9VSP       VEEEFIAANKLSHLYRYLFYVAVGLIVILLWIIRRLRKKKRQSERALKALKEATKEVKVE
ORF6_19FTW      VEEEFIAANKLSHLYRYLFYVAVGLIVILLWIIRRLRKKKRQSERALKALKEATKEVKVE
                ****************************************:*.*:****** * ******
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Figure 145B

ORF6_23FTW	DGQQ
ORF6_TIGR	DGQQ
ORF6_6BSP	DGQQ
ORF6_6BF	DGQQ
ORF6_670	DGQQ
ORF6_19AH	DGQQ
ORF6_14CSR	DGQQ
ORF6_23FP	DE--
ORF6_9VSP	DE--
ORF6_19FTW	DE-

Figure 146

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ORF7_14CSR      MDNSRRSRKKGTKKKKHPLILLLIFLVGFAVAIYPLVSRYYYRIESNEVIKEFDETVSQM
ORF7_19AH       MDNSRRSRKKGTKKKKHPLILLLIFLVGFAVAIYPLVSRYYYRIESNEVIKEFDETVSQM
ORF7_6BF        MDNSRRSRKKGTKKKKHPLILLLIFLVGFAVAIYPLVSRYYYRIESNEVIKEFDETVSQM
ORF7_6BSP       MDNSRRSRKKGTKKKKHPLILLLIFLVGFAVAIYPLVSRYYYRIESNEVIKEFDETVSQM
ORF7_670        MDNSRRSRKKGTKKKKHPLILLLIFLVGFAVAIYPLVSRYYYRIESNEVIKEFDETVSQM
ORF7_23FTW      MDNSRRSRKKGTKKKKHPLILLLIFLVGFAVAIYPLVSRYYYRIESNEVIKEFDETVSQM
ORF7_23FP       MSKSRYSRKKSVKKKKNPFILLLIFLVGLAVAMYPLVSRYYYRIESNEVIKEFDETVSQM
ORF7_9VSP       MSKSRYSRKKSVKKKKNPFILLLIFLVGLAVAMYPLVSRYYYRIESNEVIKEFDETVSQM
ORF7_19FTW      MSKSRYSRKKSVKKKKNPFILLLIFLVGLAVAMYPLVSRYYYRIESNEVIKEFDETVSQM
ORF7_TIGR       MDNSRRSRKKGTKKKKHPLILLLIFLVGFAVAIYPLVSRYYYRIESNEVIKEFDETVSQM
                *.:** ****..****:*:*********:***:***************************

ORF7_14CSR      DKAELEERWRLAQAFNATLKPSEILDPFTEQEKKKGVSEYANMLKVHERIGYVEIPAIDQ
ORF7_19AH       DKAELEERWRLAQAFNATLKPSEILDPFTEQEKKKGVSEYANMLKVHERIGYVEIPAIDQ
ORF7_6BF        DKAELEERWRLAQAFNATLKPSEILDPFTEQEKKKGVSEYANMLKVHERIGYVEIPAIDQ
ORF7_6BSP       DKAELEERWRLAQAFNATLKPSEILDPFTEQEKKKGVSEYANMLKVHERIGYVEIPAIDQ
ORF7_670        DKAELEERWRLAQAFNATLKPSEILDPFTEQEKKKGVSEYANMLKVHERIGYVEIPAIDQ
ORF7_23FTW      DKAELEERWRLAQAFNATLKPSEILDPFTEQEKKKGVSEYANMLKVHERIGYVEIPAIDQ
ORF7_23FP       DKAELEERWRLAQAFNATLKPSEILDPFTEQEKKKGVSEYANMLKVHERIGYVEIPAIDQ
ORF7_9VSP       DKAELEERWRLAQAFNATLKPSEILDPFTEQEKKKGVSEYANMLKVHERIGYVEIPAIDQ
ORF7_19FTW      DKAELEERWRLAQAFNATLKPSEILDPFTDQEKKQGVSEYANMLKVHERIGYVEIPAIEQ
ORF7_TIGR       DKAELEERWRLAQAFNATLKPSEILDPFTEQEKKKGVSEYANMLKVHERIGYVEIPAIDQ
                *****************************:****:***********************:*

ORF7_14CSR      EIPMYVGTSEEILQKGAGLLEGASLPVGGENTHTVVTAHRGLPTAELFSQLDKMKKGDVF
ORF7_19AH       EIPMYVGTSEEILQKGAGLLEGASLPVGGENTHTVVTAHRGLPTAELFSQLDKMKKGDVF
ORF7_6BF        EIPMYVGTSEEILQKGAGLLEGASLPVGGENTHTVVTAHRGLPTAELFSQLDKMKKGDVF
ORF7_6BSP       EIPMYVGTSEEILQKGAGLLEGASLPVGGENTHTVVTAHRGLPTAELFSQLDKMKKGDVF
ORF7_670        EIPMYVGTSEEILQKGAGLLEGASLPVGGENTHTVVTAHRGLPTAELFSQLDKMKKGDVF
ORF7_23FTW      EIPMYVGTSEEILQKGAGLLEGASLPVGGENTHTVVTAHRGLPTAELFSQLDKMKKGDVF
ORF7_23FP       EIPMYVGTSEEILQKGAGLLEGASLPVGGENTHTVVTAHRGLPTAELFSQLDKMKKGDIF
ORF7_9VSP       EIPMYVGTSEEILQKGAGLLEGASLPVGGENTHTVVTAHRGLPTAELFSQLDKMKKGDIF
ORF7_19FTW      EIPMYVGTSEDILQKGAGLLEGASLPVGGENTHTVITAHRGLPTAELFSQLDKMKKGDIF
ORF7_TIGR       EIPMYVGTSEDILQKGAGLLEGASLPVGGENTHTVITAHRGLPTAELFSQLDKMKKGDIF
                **********:************************:**********************:*

ORF7_14CSR      YLHVLDQVLAYQVDQILTVEPNDFEPVLIQHGEDYATLLTCTPYMINSHRLLVRGKRIPY
ORF7_19AH       YLHVLDQVLAYQVDQILTVEPNDFEPVLIQHGEDYATLLTCTPYMINSHRLLVRGKRIPY
ORF7_6BF        YLHVLDQVLAYQVDQILTVEPNDFEPVLIQHGEDYATLLTCTPYMINSHRLLVRGKRIPY
ORF7_6BSP       YLHVLDQVLAYQVDQILTVEPNDFEPVLIQHGEDYATLLTCTPYMINSHRLLVRGKRIPY
ORF7_670        YLHVLDQVLAYQVDQILTVEPNDFEPVLIQHGEDYATLLTCTPYMINSHRLLVRGKRIPY
ORF7_23FTW      YLHVLDQVLAYQVDQILTVEPNDFEPVLIQHGKDYATLLTCTPYMINSHRLLVRGKRIPY
ORF7_23FP       YLHVLDQVLAYQVDQIVTVEPNDFEPVLIQHGEDYATLLTCTPYMINSHRLLVRGKRIPY
ORF7_9VSP       YLHVLDQVLAYQVDQIVTVEPNDFEPVLIQHGEDYATLLTCTPYMINSHRLLVRGKRIPY
ORF7_19FTW      YLHVLDQVLAYQVDQIVTVEPNDFEPVLIQHGQDYATLLTCTPYMINSHRLLVRGKRIPY
ORF7_TIGR       YLHVLDQVLAYQVDQIVTVEPNDFEPVLIQHGEDYATLLTCTPYMINSHRLLVRGKRIPY
                ****************:***************:***************************

ORF7_14CSR      TAPIAERNRAVRERGQFWLWLLLAALVMILVLSYGVYRHRRIVKGLEKQLEEHHVKG
ORF7_19AH       TAPIAERNRAVRERGQFWLWLLLAALVMILVLSYGVYRHRRIVKGLEKQLEEHHVKG
ORF7_6BF        TAPIAERNRAVRERGQFWLWLLLAALVMILVLSYGVYRHRRIVKGLEKQLEEHHVKG
ORF7_6BSP       TAPIAERNRAVRERGQFWLWLLLAALVMILVLSYGVYRHRRIVKGLEKQLEEHHVKG
ORF7_670        TAPIAERNRAVRERGQFWLWLLLAALVMILVLSYGVYRHRRIVKGLEKQLEEHHVKG
ORF7_23FTW      TAPIAERNRAVRERGQFWLWLLLAALVMILVLSYGVYRHRRIVKGLEKQLEEHHVKG
ORF7_23FP       TAPIAERNRAVRERGQFWLWLLLGAMAVILLLLYRVYRNRRIVKGLEKQLEGRHVKD
ORF7_9VSP       TAPIAERNRAVRERGQFWLWLLLGAMAVILLLLYRVYRNRRIVKGLEKQLEGRHVKD
ORF7_19FTW      TAPIAERNRAVRERGQFWLWLLLGAMAVILLLLYRVYRNRRIVKGLEKQLEGRHVKD
ORF7_TIGR       TAPIAERNRAVRERGQFWLWLLLGAMAVILLLLYRVYRNRRIVKGLEKQLEGRHVKD
                ***********************.*:.:**:* * ***:************ :***.
```

Figure 147

```
ORF8_14CSR      MSKAKLQKLLGYLLMLVALVIPVYCFGQMVLQSLGQVKGHEIFSESVTADSYQEQLQRSL
ORF8_19AH       MSKAKLQKLLGYLLMLVALVIPVYCFGQMVLQSLGQVKGHEIFSESVTADSYQEQLQRSL
ORF8_23FTW      MSKAKLQKLLGYLLMLVALVIPVYCFGQMVLQSLGQVKGHEIFSESVTADSYQEQLQRSL
ORF8_670        MSKAKLQKLLGYLLMLVALVIPVYCFGQMVLQSLGQVKGHEIFSESVTADSYQEQLQRSL
ORF8_6BF        MSKAKLQKLLGYLLMLVALVIPVYCFGQMVLQSLGQVKGHEIFSESVTADSYQEQLQRSL
ORF8_6BSP       MSKAKLQKLLGYLLMLVALVIPVYCFGQMVLQSLGQVKGHEIFSESVTADSYQEQLQRSL
ORF8_19FTW      MSRTKLRALLGYLLMLVACLIPIYCFGQMVLQSLGQVKGHATFVKSMTTEMYQEQQNHSL
ORF8_23FP       MSRTKLRALLGYLLMLVACLIPIYCFGQMVLQSLGQVKGHATFVKSMTTEMYQEQQNHSL
ORF8_9VSP       MSRTKLRALLGYLLMLVACLIPIYCFGQMVLQSLGQVKGHATFVKSMTTEMYQEQQNHSL
ORF8_TIGR       MSRTKLRALLGYLLMLVACLIPIYCFGQMVLQSLGQVKGHATFVKSMTTEMYQEQQNHSL
                **::**: ********** :**:*****************  * :*:*:: **** ::**

ORF8_14CSR      DYNQRLDSQNRIVDPFLAEGYEVNYQVSDDPDAVYGYLSIPSLEIMEPVYLGADYHHLAM
ORF8_19AH       DYNQRLDSQNRIVDPFLAEGYEVNYQVSDDPDAVYGYLSIPSLEIMEPVYLGADYHHLAM
ORF8_23FTW      DYNQRLDSQNRIVDPFLAEGYEVNYQVSDDPDAVYGYLSIPSLEIMEPVYLGADYHHLAM
ORF8_670        DYNQRLDSQNRIVDPFLAEGYEVNYQVSDDPDAVYGYLSIPSLEIMEPVYLGADYHHLAM
ORF8_6BF        DYNQRLDSQNRIVDPFLAEGYEVNYQVSDDPDAVYGYLSIPSLEIMEPVYLGADYHHLAM
ORF8_6BSP       DYNQRLDSQNRIVDPFLAEGYEVNYQVSDDPDAVYGYLSIPSLEIMEPVYLGADYHHLAM
ORF8_19FTW      AYNQRLASQNRIVDPFLAEGYEVNYQVSDDPDAVYGYLSIPSLEIMEPVYLGADYHHLGM
ORF8_23FP       AYNQRLASQNRIVDPFLAEGYEVNYQVSDDPDAVYGYLSIPSLEIMEPVYLGADYHHLGM
ORF8_9VSP       AYNQRLASQNRIVDPFLAEGYEVNYQVSDDPDAVYGYLSIPSLEIMEPVYLGADYHHLGM
ORF8_TIGR       AYNQRLASQNRIVDPFLAEGYEVNYQVSDDPDAVYGYLSIPSLEIMEPVYLGADYHHLGM
                 ***** ***************************************************.*

ORF8_14CSR      GLAHVDGTPLPVEGKGIRSVIAGHRAEPSHVFFRHLDQLKVGDALYYDNGQEIVEYQMMD
ORF8_19AH       GLAHVDGTPLPVEGKGIRSVIAGHRAEPSHVFFRHLDQLKVGDALYYDNGQEIVEYQMMD
ORF8_23FTW      GLAHVDGTPLPVEGKGIRSVIAGHRAEPSHVFFRHLDQLKVGDALYYDNGQEIVEYQMMD
ORF8_670        GLAHVDGTPLPVEGKGIRSVIAGHRAEPSHVFFRHLDQLKVGDALYYDNGQEIVEYQMMD
ORF8_6BF        GLAHVDGTPLPVEGKGIRSVIAGHRAEPSHVFFRHLDQLKVGDALYYDNGQEIVEYQMMD
ORF8_6BSP       GLAHVDGTPLPVEGKGIRSVIAGHRAEPSHVFFRHLDQLKVGDALYYDNGQEIVEYQMMD
ORF8_19FTW      GLAHVDGTPLPLDGTGIRSVIAGHRAEPSHVFFRHLDQLKVGDALYYDNGQEIVEYQMMD
ORF8_23FP       GLAHVDGTPLPLDGTGIRSVIAGHRAEPSHVFFRHLDQLKVGDALYYDNGQEIVEYQMMD
ORF8_9VSP       GLAHVDGTPLPLDGTGIRSVIAGHRAEPSHVFFRHLDQLKVGDALYYDNGQEIVEYQMMD
ORF8_TIGR       GLAHVDGTPLPLDGTGIRSVIAGHRAEPSHVFFRHLDQLKVGDALYYDNGQEIVEYQMMD
                ***********::*.*********************************************

ORF8_14CSR      TEIILPSEWEKLESVSSKNIMTLITCDPIPTFNKRLLVNFERVAVYQKSDPQTAAVARVA
ORF8_19AH       TEIILPSEWEKLESVSSKNIMTLITCDPIPTFNKRLLVNFERVAVYQKSDPQTAAVARVA
ORF8_23FTW      TEIILPSEWEKLESVSSKNIMTLITCDPIPTFNKRLLVNFERVAVYQKSDPQTAAVARVA
ORF8_670        TEIILPSEWEKLESVSSKNIMTLITCDPIPTFNKRLLVNFERVAVYQKSDPQTAAVARVA
ORF8_6BF        TEIILPSEWEKLESVSSKNIMTLITCDPIPTFNKRLLVNFERVAVYQKSDPQTAAVARVA
ORF8_6BSP       TEIILPSEWEKLESVSSKNIMTLITCDPIPTFNKRLLVNFERVAVYQKSDPQTAAVARVA
ORF8_19FTW      TEIILPSEWEKLESVSSKNIMTLITCDPIPTFNKRLLVNFERVAVYQKSDPQTAAVARVA
ORF8_23FP       TEIILPSEWEKLESVSSKNIMTLITCDPIPTFNKRLLVNFERVAVYQKSDPQTAAVARVA
ORF8_9VSP       TEIILPSEWEKLESVSSKNIMTLITCDPIPTFNKRLLVNFERVAVYQKSDPQTAAVARVA
ORF8_TIGR       TEIILPSEWEKLESVSSKNIMTLITCDPIPTFNKRLLVNFERVAVYQKSDPQTAAVARVA
                ************************************************************

ORF8_14CSR      FTKEGQSVSRVATSQWLYRGLVVLAFLGILFVLWKLARLLRGK
ORF8_19AH       FTKEGQSVSRVATSQWLYRGLVVLAFMGILFVLWKLARLLRGK
ORF8_23FTW      FTKEGQSVSRVATSQWLYRGLVVLAFLGILFVLWKLARLLRGK
ORF8_670        FTKEGQSVSRVATSQWLYRGLVVLAFLGILFVLWKLARLLRGK
ORF8_6BF        FTKEGQSVSRVATSQWLYRGLVVLAFLGILFVLWKLARLLRGK
ORF8_6BSP       FTKEGQSVSRVATSQWLYRGLVVLAFLGILFVLWKLARLLRGK
ORF8_19FTW      FTKEGQSVSRVATSQWLYRGLVVLAFLGILFVLWKLARLLRGK
ORF8_23FP       FTKEGQSVSRVATSQWLYRGLVVLAFLGILFVLWKLARLLRGK
ORF8_9VSP       FTKEGQSVSRVATSQWLYRGLVVLAFLGILFVLWKLARLLRGK
ORF8_TIGR       FTKEGQSVSRVATSQWLYRGLVVLAFLGILFVLWKLARLLRGK
                **************************:****************
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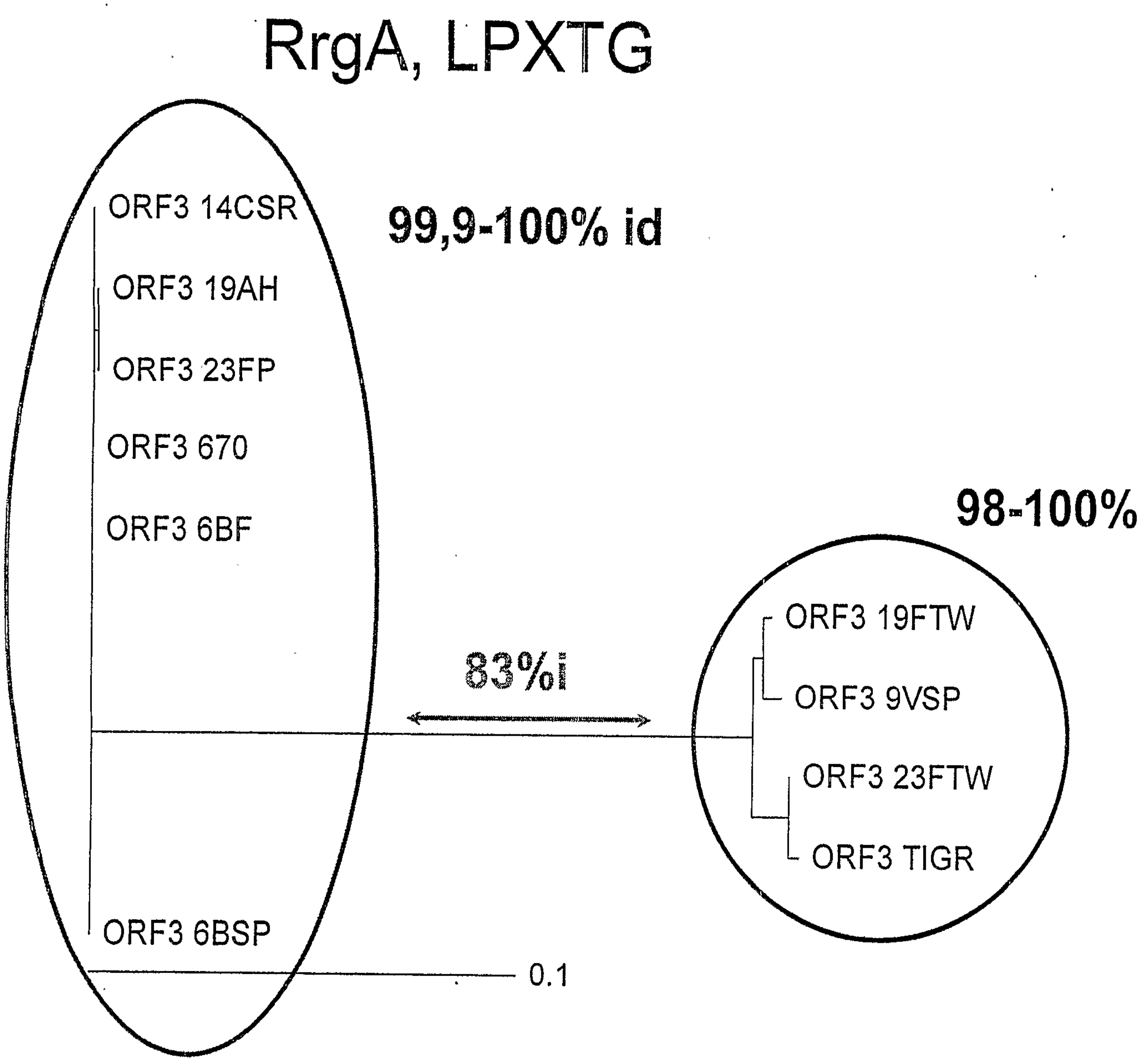

RrgA, LPXTG
ORF3 14CSR
ORF3 19AH
ORF3 23FP
ORF3 670
ORF3 6BF
ORF3 6BSP
99,9-100% id
83%i
98-100%
ORF3 19FTW
ORF3 9VSP
ORF3 23FTW
ORF3 TIGR
0.1

Figure 148

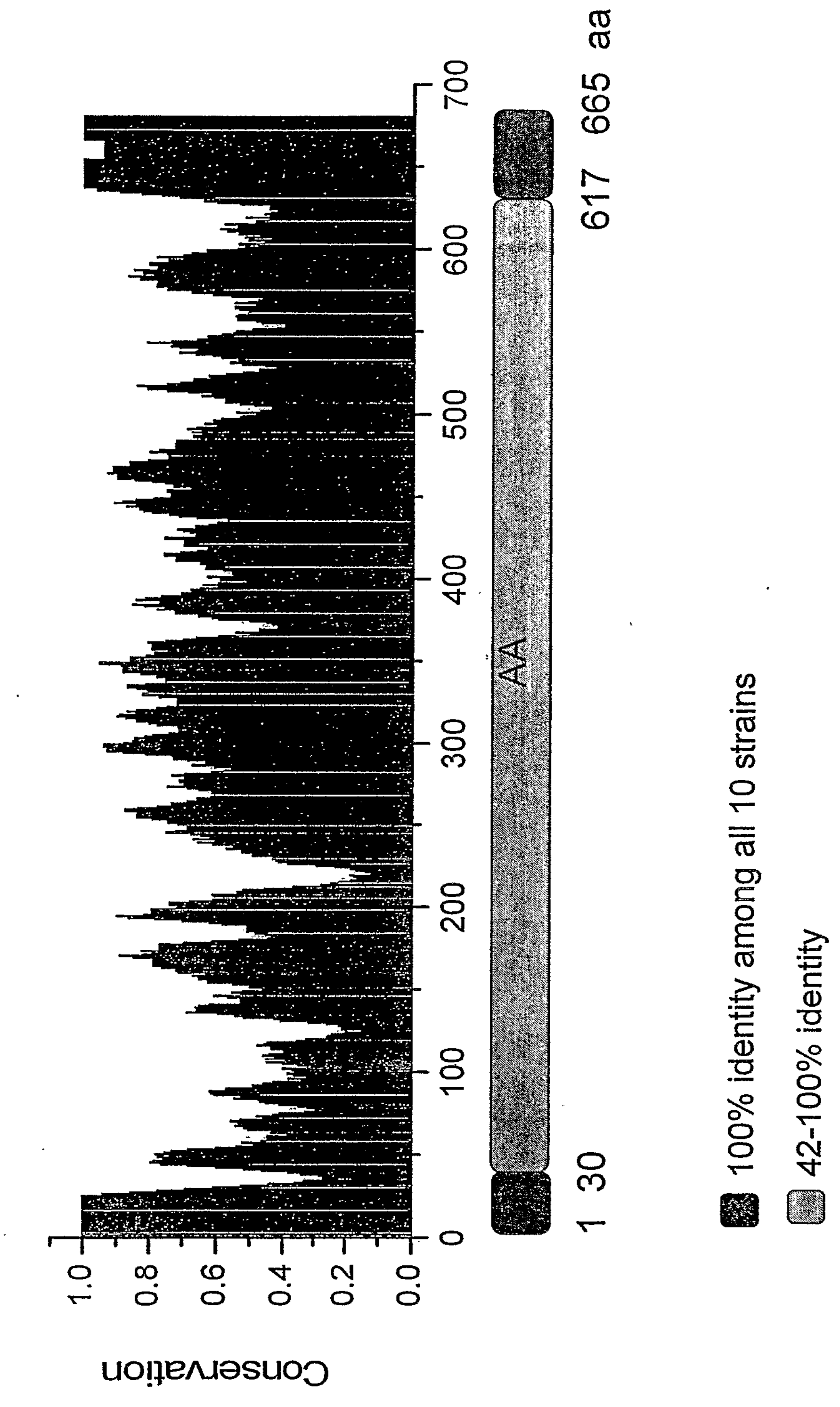

Conservation
1.0
0.8
0.6
0.4
0.2
0.0
0
100
200
300
400
500
600
700
AA
1
30
617
665
aa
100% identity among all 10 strains
42-100% identity

Figure 149

A

_MLNRETHMKKVRKIFQKAVAGLCCISQLTAFSSIVALA_*ETPETSPAIGKVVIKETGEGGALLGDAVFELKN
NTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPPVGYKPSTKQWTVEVEKNGRTTVQGEQVENREE
ALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKALNPNPYERVIPEGTLSKRIYQVNNLDDNQYGIEL
TVSGKTVYEQKDKSVPLDVVILLDNSNSMSNIRNKNARRAERAGEATRSLIDKITSDSENRVALVTYAS
TIFDGTEFTVEKGVADKNGKRLNDSLFWNYDQTSFTTNTKDYSYLKLTNDKNDIVELKNKVPTEAEDHD
GNRLMYQFGATFTQKALMKADEILTQQARQNSQKVIFHITDGVPTMSYPINFNHATFAPSYQNQLNA
FFSKSPNKDGILLSDFITQATSGEHTIVRGDGQSYQMFTDKTVYEKGAPAAFPVKPEKYSEMKAAGYAVI
GDPINGGYIWLNWRESILAYPFNSNTAKITNHGDPTRWYYNGNIAPDGYDVFTVGIGINGDPGTDEATA
TSFMQSISSKPENYTNVTDTTKILEQLNRYFHTIVTEKKSIENGTITDPMGELIDLQLGTDGRFDPADYTL
TANDGSRLENGQAVGGPQNDGGLLKNAKVLYDTTEKRIRVTGLYLGTDEKVTLTYNVRLNDEFVSNKFYD
TNGRTTLHPKEVEQNTVRDFPIPKIRDVRKYPEITISKEKKLGDIEFIKVNKNDKKPLRGAVFSLQKQHPDYP
DIYGAIDQNGTYQNVRTGEDGKLTFKNLSDGKYRLFENSEPAGYKPVQNKPIVAFQIVNGEVRDVTSIVPQ
DIPAGYEFTNDKHYITNEPIPPKRE_YPRTGGIGMLPFYLIGCMMMGGVLLYTRKHP_

B

5’ cg**_ggatcc_-gaa-acg-cct-gaa-acc-agt** 5’ 24mer, 54 %G+C, Tm 62
BamHI
3’ ccg***ctcgag-aat-agg-ttc-att-ggt*** 3’ 27mer, 52 %G+C, Tm 61.6
XhoI

Figure 150

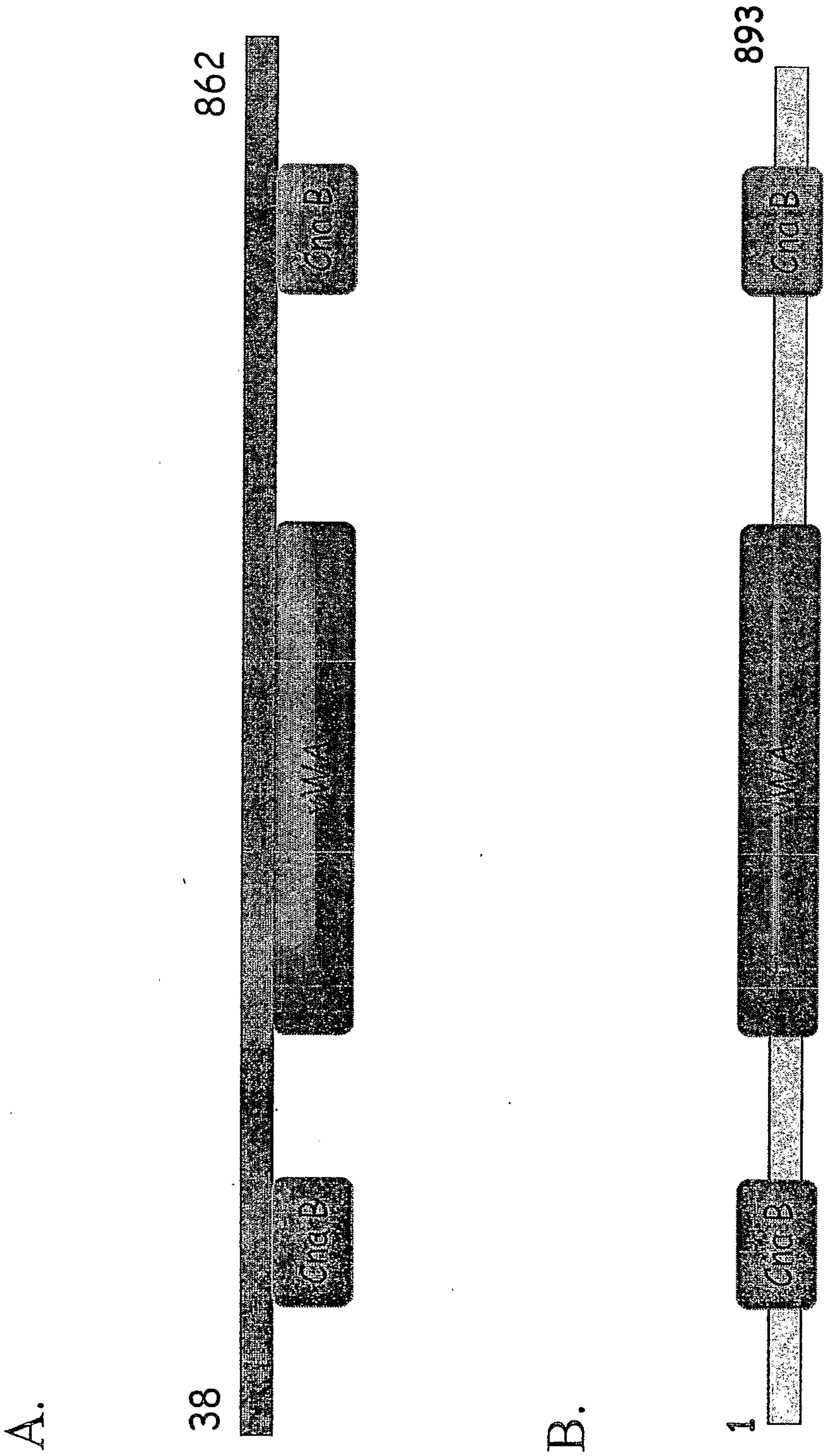
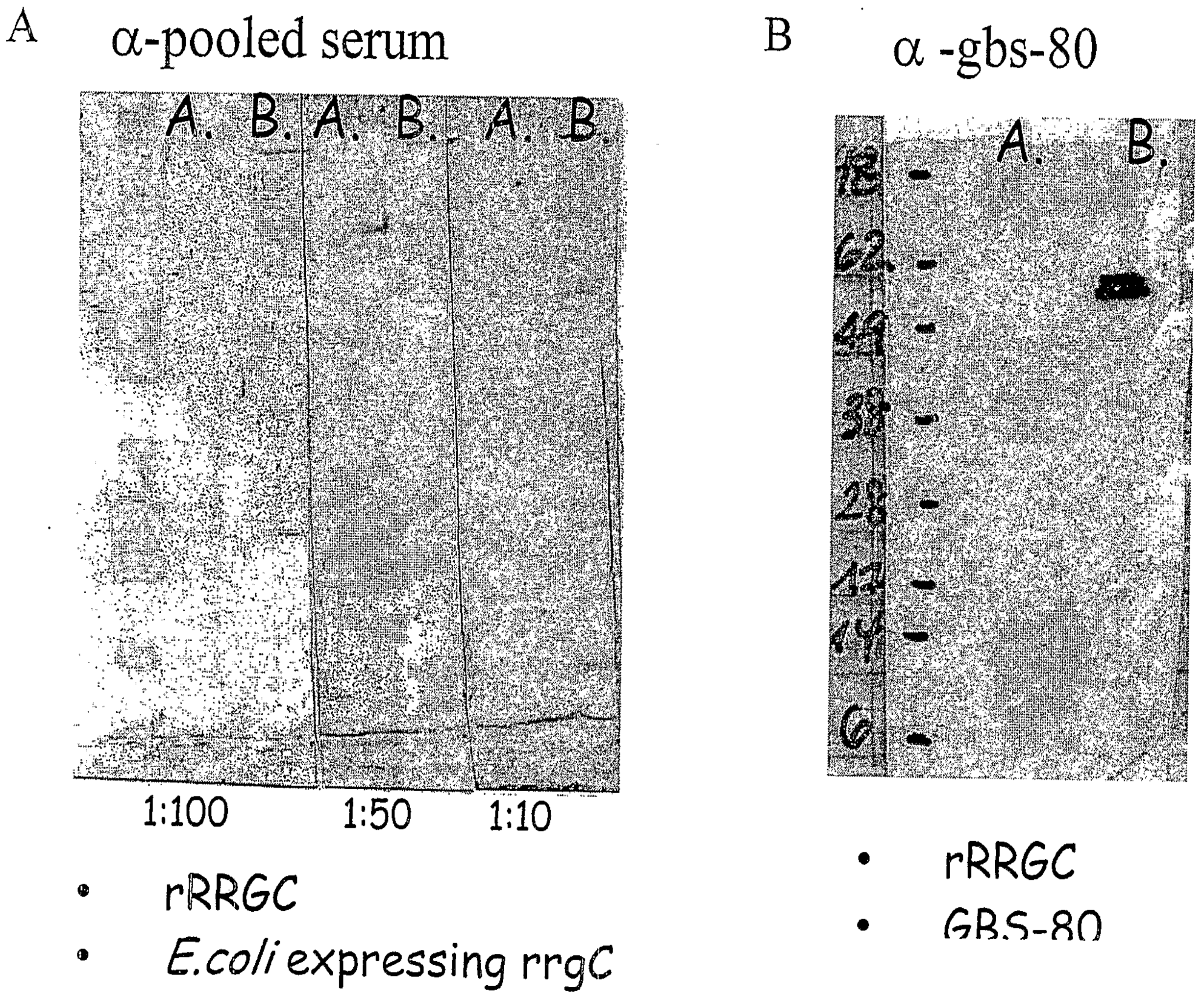


Figure 151

Figure 152


A
α-pooled serum
A. B. A. B. A. B.
1:100
1:50
1:10
rRRGC
E.coli expressing rrgC
B
α -gbs-80
A. B.
98
62
49
38
28
17
14
6
rRRGC
GBS-80

A

*MKSINKFLTMLAALLLTASSLFS**AATVFAAGTTTTSVTVHKLLATDGDMDKIANELETGNYAGNKVGVLPA
NAKEIAGVMFVWTNTNNEIIDENGQTLGVNIDPQTFKLSGAMPATAMKKLTEAEGAKFNTANLPAAKYKIY
EIHSLSTYVGEDGATLTGSKAVPIEIELPLNDVVDAHVYPKNTEAKPKIDKDFKGKANPDTPRVDKDTPVNHQV
GDVVEYEIVTKIPALANYATANWSDRMTEGLAFNKGTVKVTVDDVALEAGDYALTEVATGFDLKLTDAGLAK
VNDQNAEKTVKITYSATLNDKAIVEVPESNDVTFNYGNNPDHGNTPKPNKPNENGDLTLTKTWVDATGAPIP
AGAEATFDLVNAQTGKVVQTVTLTTDKNTVTVNGLDKNTEYKFVERSIKGYSADYQEITTAGEIAVKNWKD
ENPKPLDPTEPKVVTYGKKFVKVNDKDNRLAGAEFVIANADNAGQYLARKADKVSQEEKQLVVTTKDALDRAV
AAYNALTAQQQTQQEKEKVDKAQAAYNAAVIAANNAFEWVADKDNENVVKLVSDAQGRFEITGLLAGTY
YLEETKQPAGYALLTSRQKFEVTATSYSATGQGIEYTAGSGKDDATKVVNKKIT*IPQTGGIGTIIFAVAGAAI*
MGIAVYAYVKNNKDEDQLA

B

5' cg*ggatcc*-**gct-gca-aca-gtt-ttt** 3' 23mer, 52.2% G+C, Tm 60.6
BamHI
5'*ccgctcgag*-**agt-gat-ttt-ttt-gtt-gac** 3' 26mer, 44.4% G+C, Tm 61.7
XhoI

Figure 153

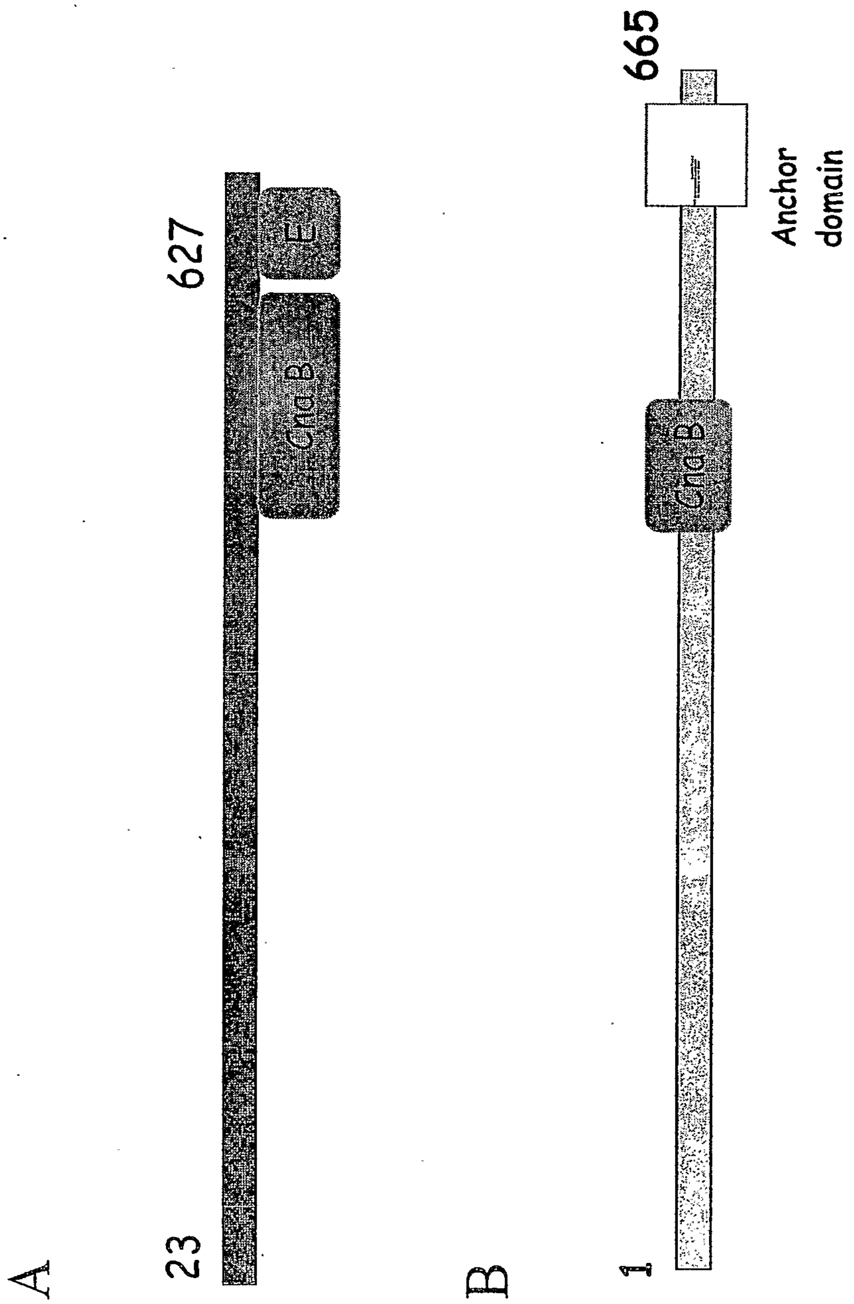


Figure 154

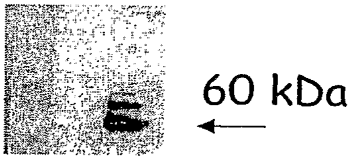


Figure 155

354/487

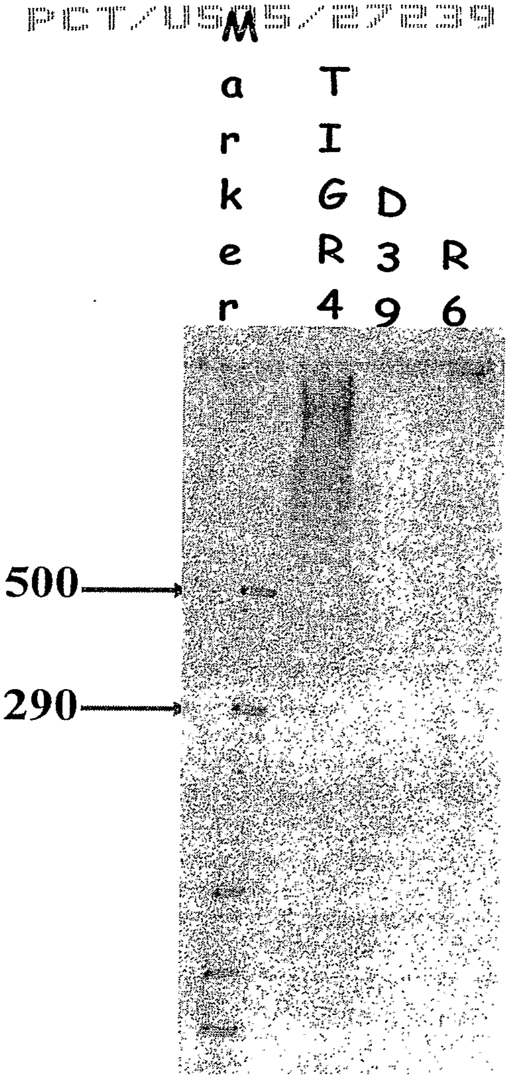


Figure 156

A

_MISRIFFVMALCFSLVWGA_*HAVQAQEDHTLVLQLENYQEVVSQLPSRDGHRLQVWKLDDSYS
YDDRVQIVRDLHSWDENKLSSFKKTSFEMTFLENQIEVSHIPNGLYYVRSIIQTDAVSYPAEFLF
EMTDQTVEPLVIVAKKTDTMTTKVKLIKVDQDHNRLEGVGFKLVSVARDVSEKEVPLIGEYRYSSS
GQVGRTLYTDKNGEIFVTNLPLGNYRFKEVEPLAGYAVTTLDTDVQLVDHQLVTITVVNQKLPRGN
VDFMKVDGRTNTSLQGAMFKVMKEESGHYTPVLQNGKEVVVTSGKDGRFRVEGLEYGTYYLWELQ
APTGYVQLTSPVSFTIGKDTRKELVTVVKNNK*RPRIDVPDTGEETLYILMLVAILLFGSGYYLTKKP*
NN

B

5' cg*ggatcc*-**cat-gca-gtc-caa-gcg-caa-gaa** 21mer, 61% G+C, Tm 60.8
BamHI
5' ccg*ctcgag*-**ctt-gtt-att-ttt-aac-cac** 27mer, 44% G+C, Tm 58.4
XhoI

Figure 157

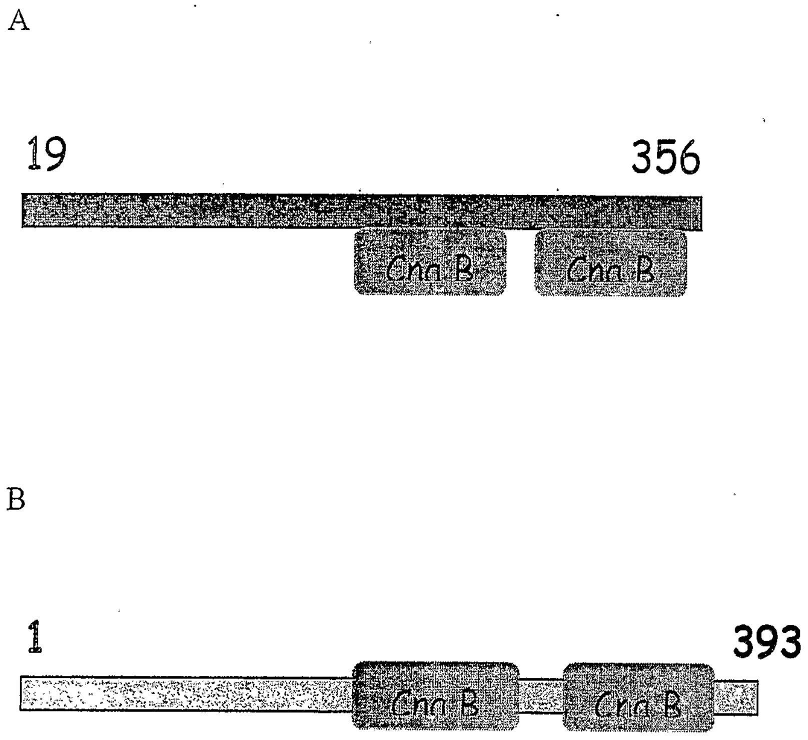


Figure 158

Figure 159

358/487

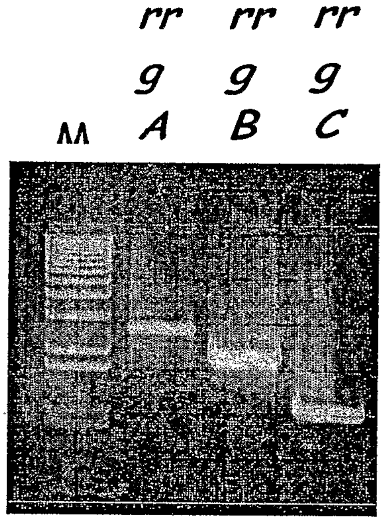
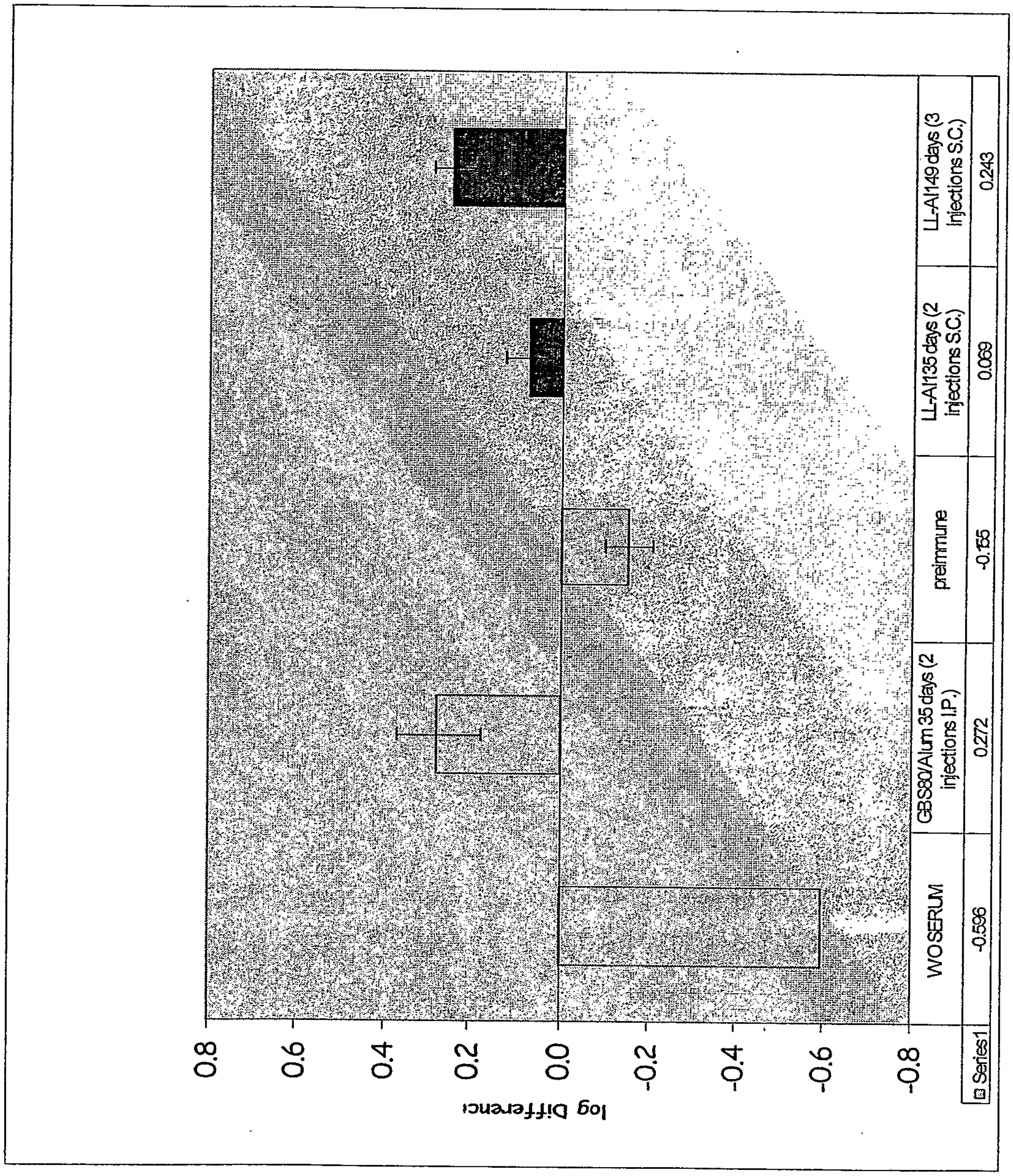


Figure 160

Figure 161


log Differenc
0.8
0.6
0.4
0.2
0.0
-0.2
-0.4
-0.6
-0.8
WO SERUM
GBS80/Alum 35 days (2 injections I.P.)
preimmune
LL-AI135 days (2 injections S.C.)
LL-AI149 days (3 injections S.C.)
Series1
-0.596
0.272
-0.155
0.069
0.243

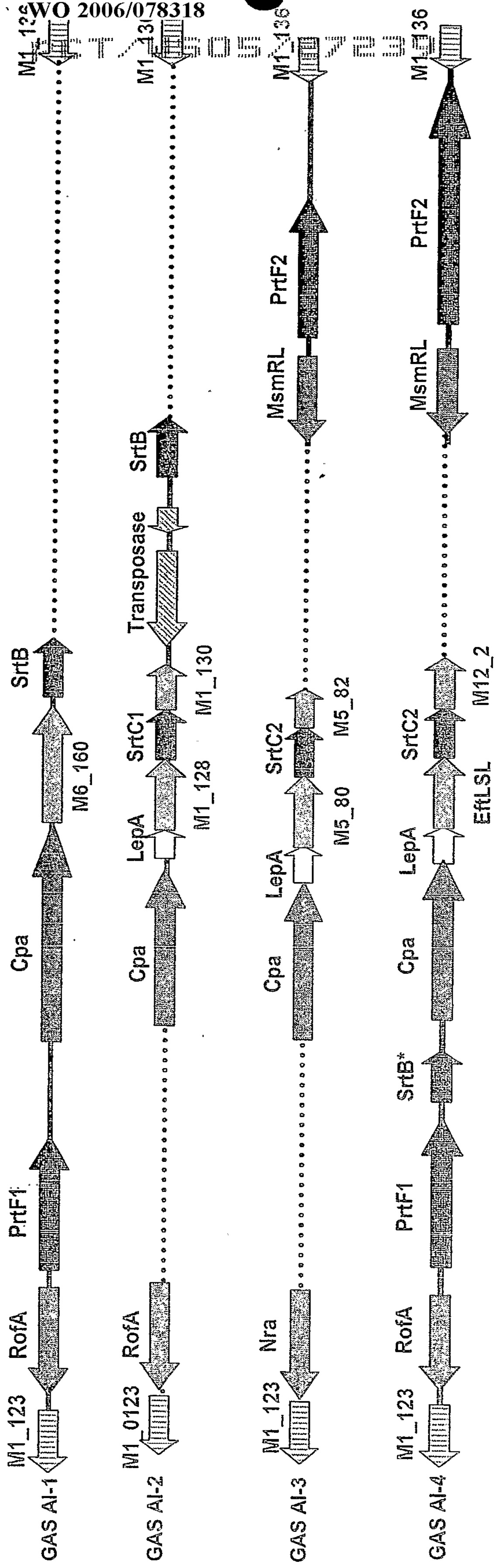
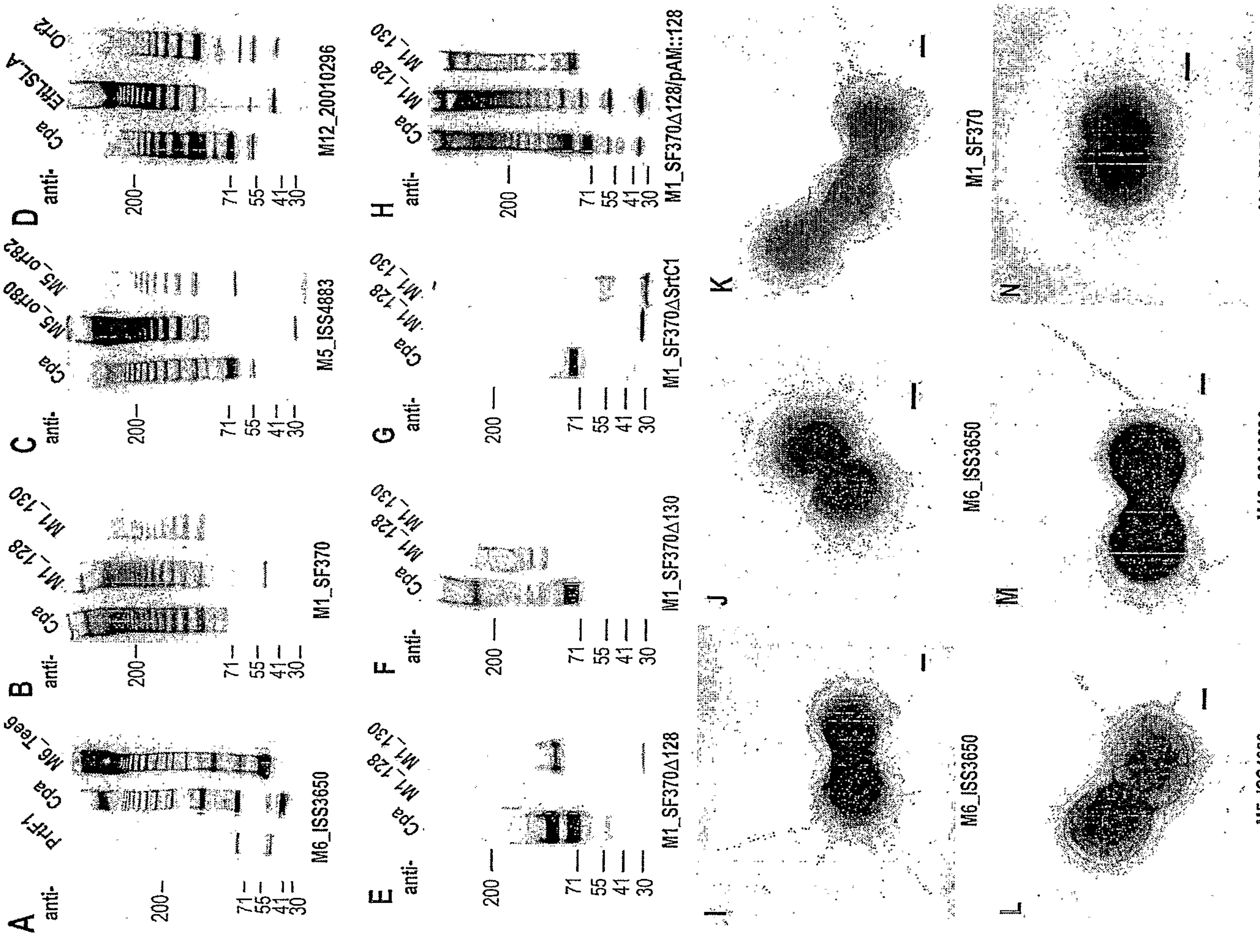
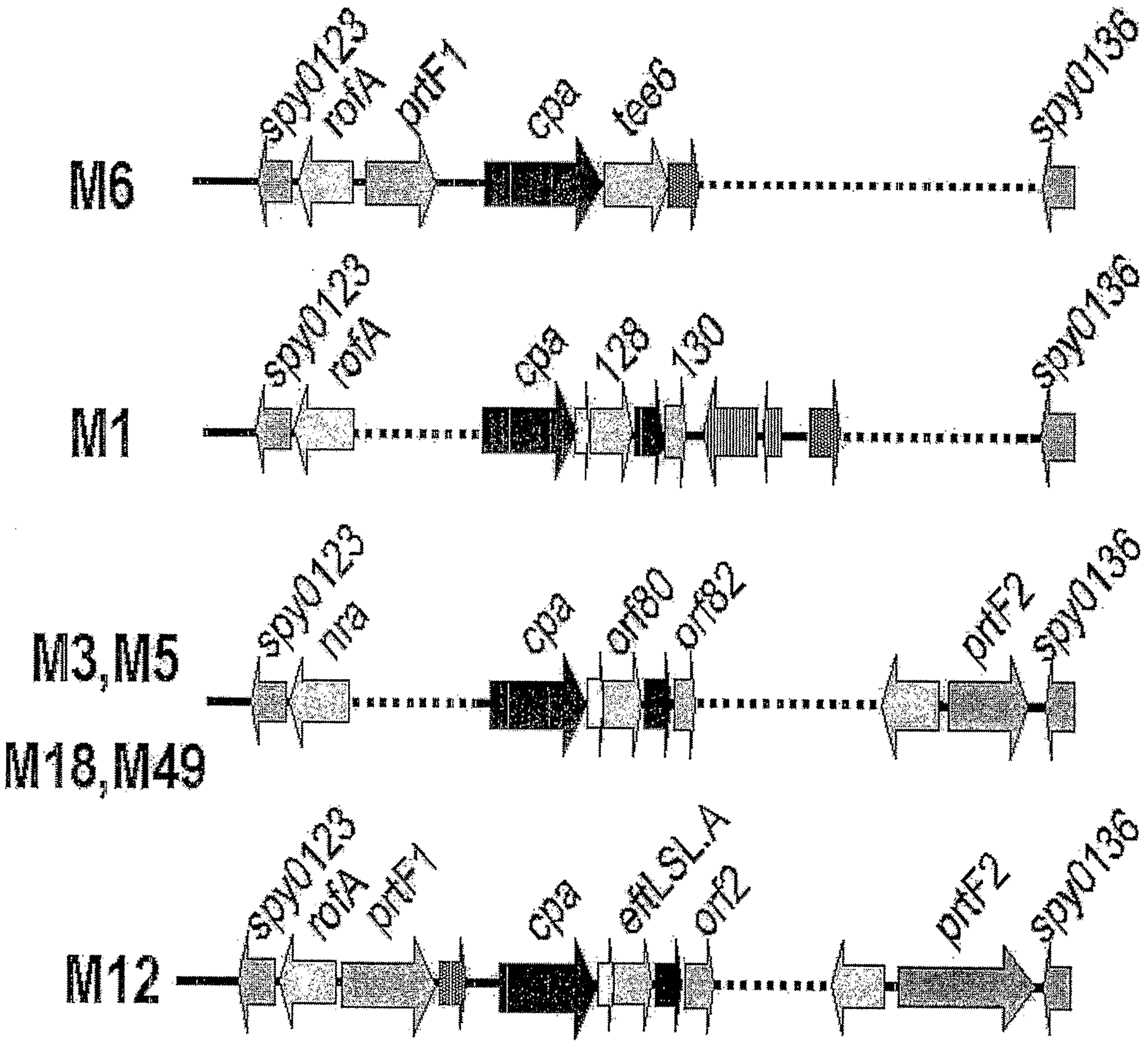

GAS AI-1
M1_123
RofA
PrtF1
Cpa
M6_160
SrtB
M1_12
GAS AI-2
M1_0123
RofA
Cpa
LepA
M1_128
SrtC1
M1_130
Transposase
SrtB
M1_13
GAS AI-3
M1_123
Nra
Cpa
LepA
M5_80
SrtC2
M5_82
MsmRL
PrtF2
M1_136
GAS AI-4
M1_123
RofA
PrtF1
SrtB*
Cpa
LepA
EftLSL
SrtC2
M12_2
MsmRL
PrtF2
M1_136

FIGURE 162

Figure 163


A
anti-
PrtF1
Cpa
M6_Tee6
200—
71—
55—
41—
30—
M6_ISS3650
B
anti-
Cpa
M1_128
M1_130
M1_SF370
C
anti-
Cpa
M5_orf80
M5_orf82
M5_ISS4883
D
anti-
Cpa
EftLSL.A
Orf2
M12_20010296
E
anti-
Cpa
M1_128
M1_130
M1_SF370Δ128
F
anti-
Cpa
M1_128
M1_130
M1_SF370Δ130
G
anti-
Cpa
M1_128
M1_130
M1_SF370ΔSrtC1
H
anti-
Cpa
M1_128
M1_130
M1_SF370Δ128/pAM::128
I
M6_ISS3650
J
M6_ISS3650
K
M1_SF370
L
M5_ISS4883
M
M12_20010296
N
M1_SF370Δ128


M6
spy0123
rofA
prtF1
cpa
tee6
spy0136
M1
spy0123
rofA
cpa
128
130
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M3,M5
M18,M49
spy0123
nra
cpa
orf80
orf82
prtF2
spy0136
M12
spy0123
rofA
prtF1
cpa
eftLSL.A
orf2
prtF2
spy0136

Figure 164

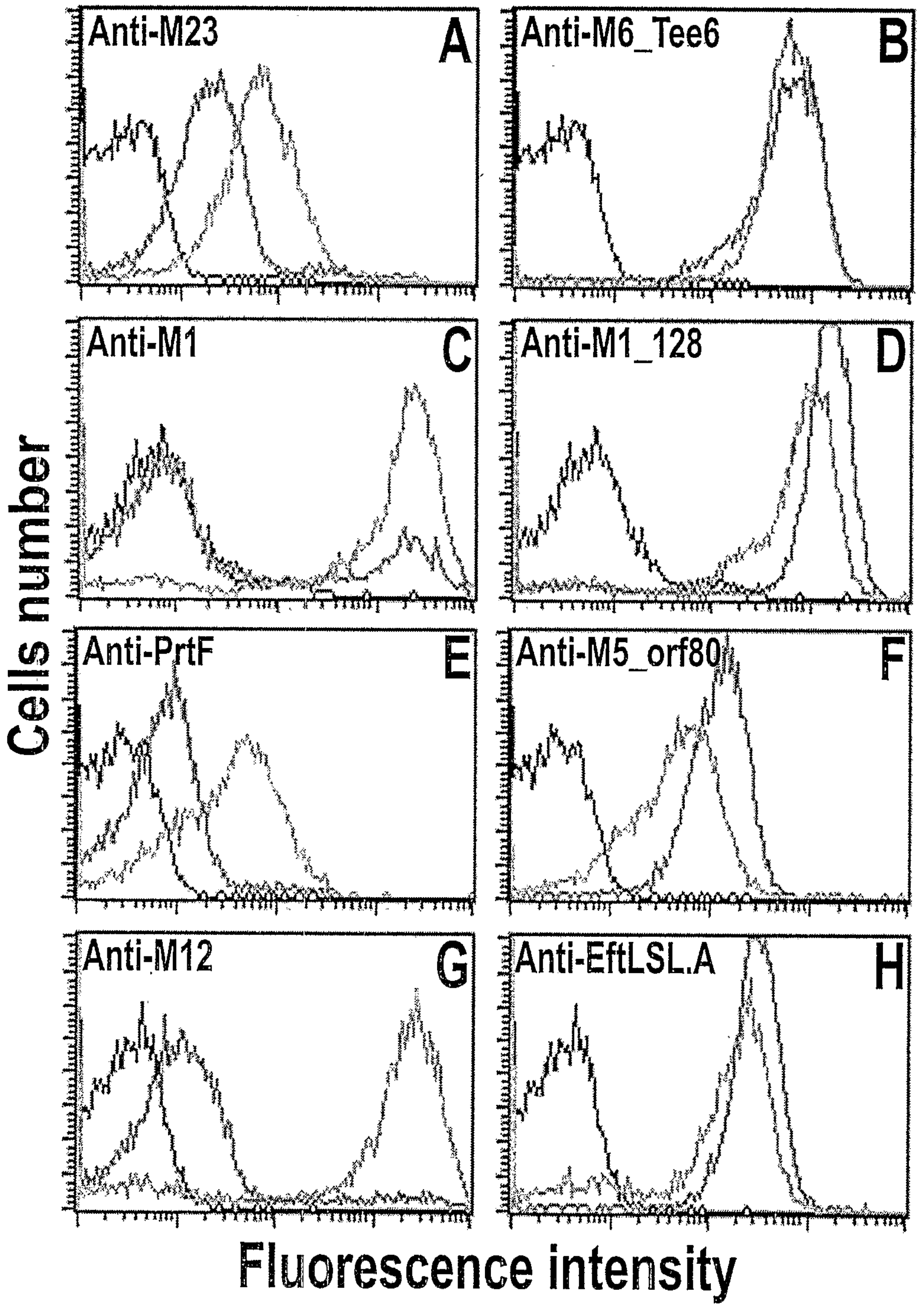

Anti-M23
A
Anti-M6_Tee6
B
Anti-M1
C
Anti-M1_128
D
Anti-PrtF
E
Anti-M5_orf80
F
Anti-M12
G
Anti-EftLSL.A
H
Cells number
Fluorescence intensity

Figure 165

PCT/US05/27239

364/487

Figure 166

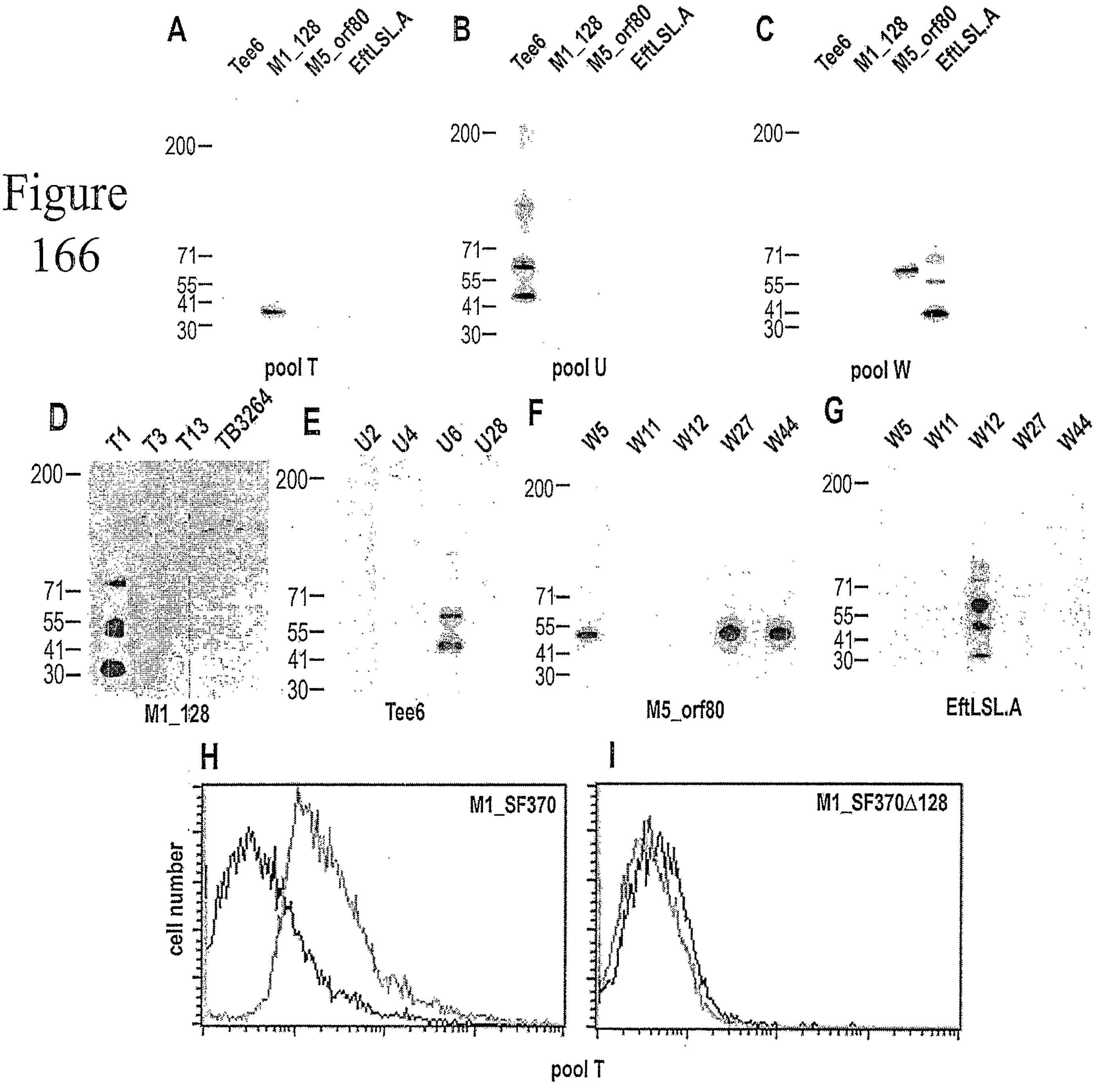


Figure 167

		PCR						Sequence
Strain	**M-type**	**SrtB**	**SrtC1**	**SrtC2**	**MsmRL**	**SipA2**	**AI**	
2724	6	+	-	-	-	-	1	
2894	6	+	-	-	-	-	1	
3650	6	+	-	-	-	-	1	
5529	6	+	-	-	-	-	1	
Dsm2071	23	+	-	-	-	-	1	+
SF370	1	+	+	-	-	-	2	literature
2580	1	+	+	-	-	-	2	
2913	1	+	+	-	-	-	2	
3280	1	+	+	-	-	-	2	
3348	1	+	+	-	-	-	2	
2719	?	+	+	-	-	-	2	
2721	3	-	-	+	+	+	3	
3040	3	-	-	+	+	+	3	
3135	3	-	-	+	+	+	3	
3776	44 ?	-	-	+	+	+	3	+
4959	77	-	-	+	+	+	3	+
4088	**Clinical isolate**	-	-	+	+	+	3	
2728	12	+	-	+	+	+	4	
2720	9	+	-	+	+	+	4	+
2727	11	+	-	+	+	+	4	+
4436	28	+	-	+	+	+	4	+
5481	44 ?	+	-	+	+	+	4	+
4538	50	+	-	+	+	+	4	+
3789	78	+	-	+	+	+	4	+
4883	5	+	-	+	+	+	4	
5476	89	+	-	+	+	+	4	
5495	?	+	-	+	+	+	4	
2722	4	-	-	-	-	-	?	
2723	5?	-	-	-	-	-	?	
2725	8	-	-	+	-	-	?	
2726	2	-	-	-	-	-	?	
2634	4	-	-	-	-	-	?	
5531	75	+	+	-	-	-	?	**In progress**

366/487

Figure 168

Immuno-electronmicroscopy
(Immunogold Negative Staining,
1° α - 80, 2° α-mouse gold particles 10nm)

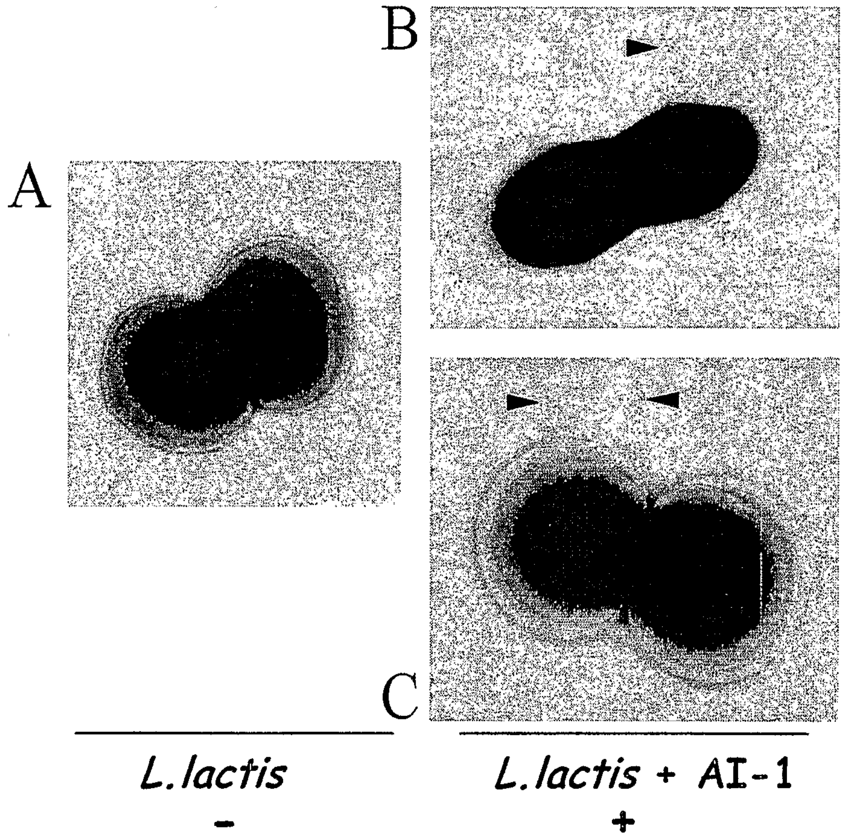


Figure 169

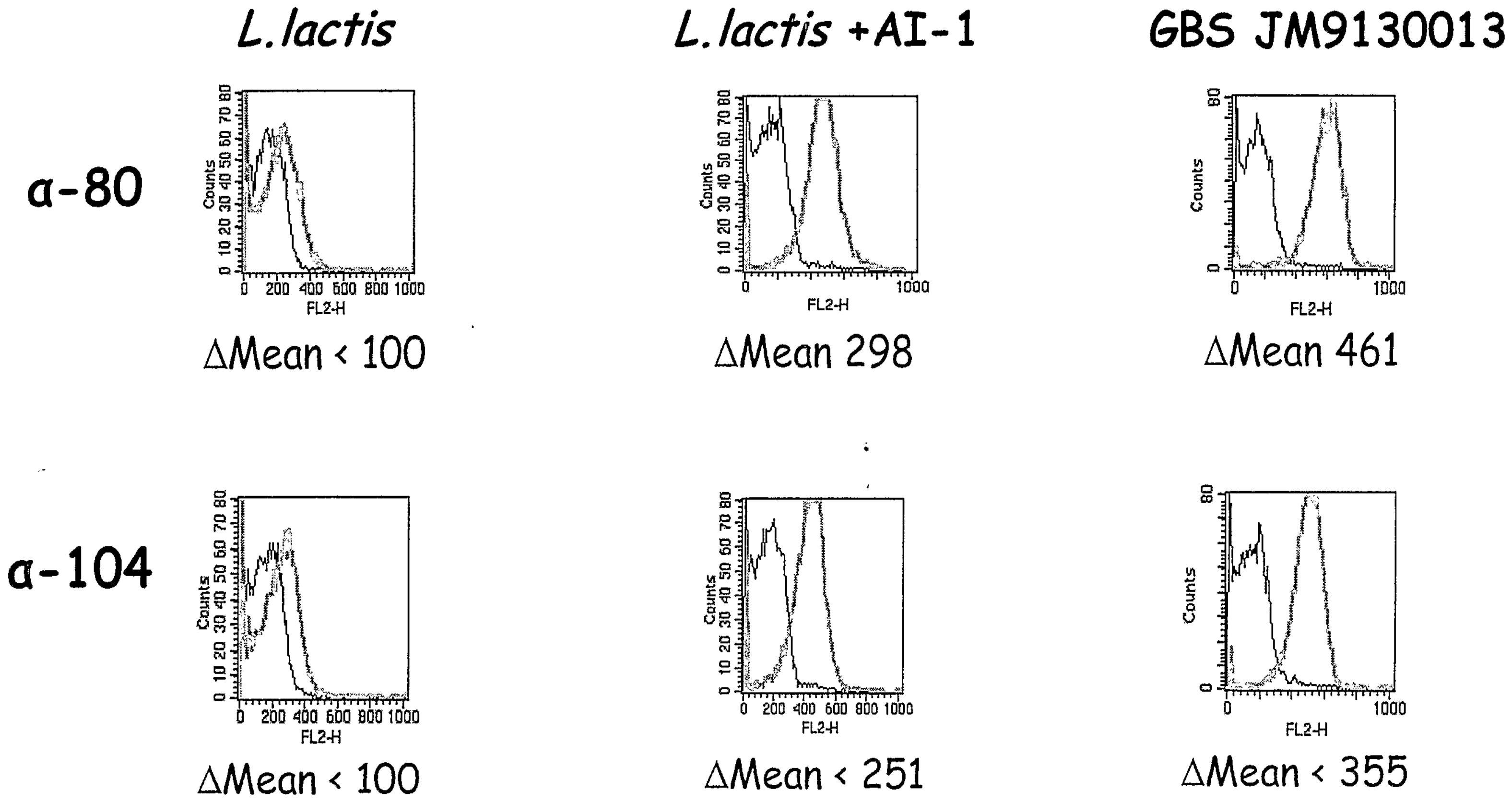
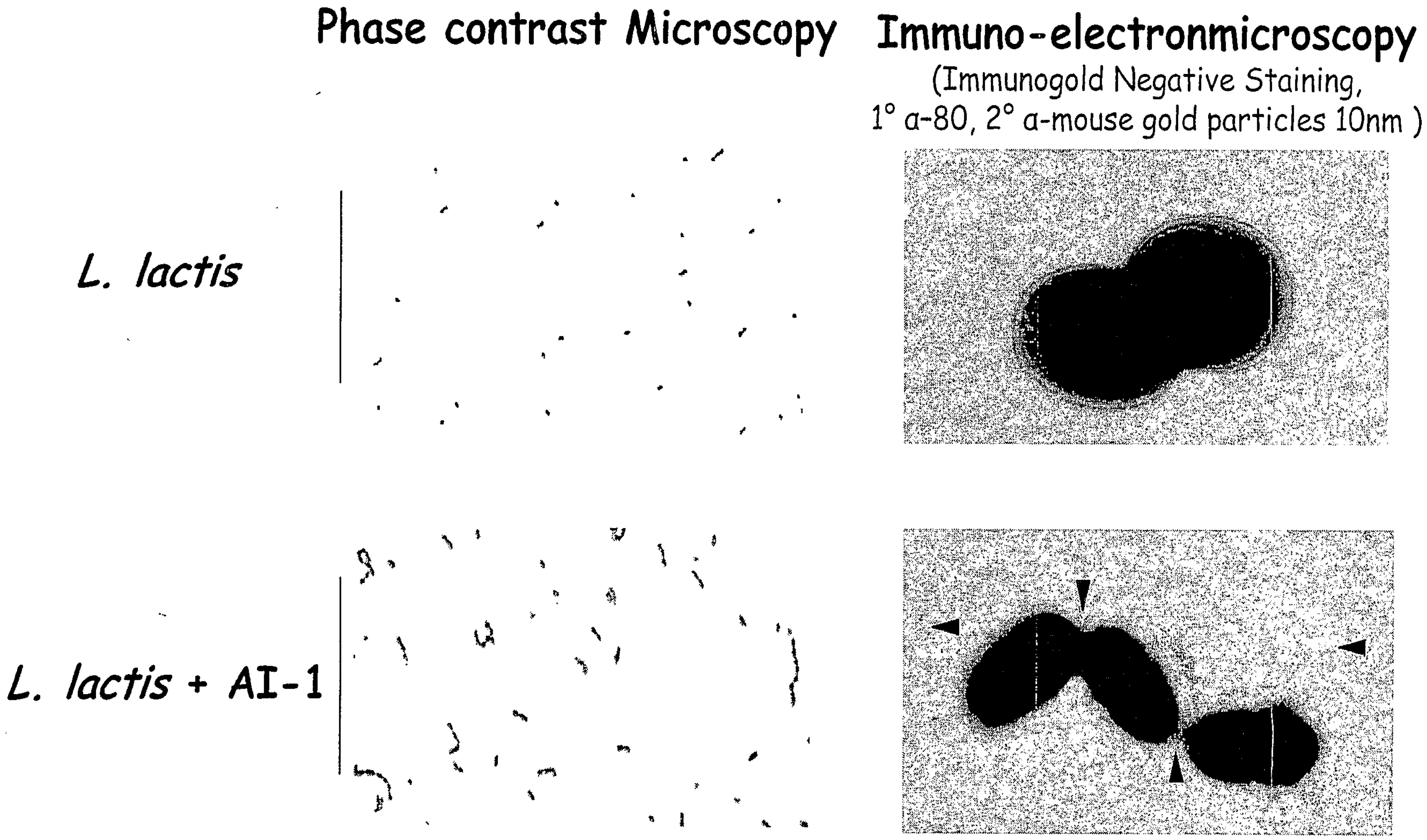

L.lactis
L.lactis +AI-1
GBS JM9130013
α-80
α-104
Counts
FL2-H
0
10
20
30
40
50
60
70
80
200
400
600
800
1000
ΔMean < 100
ΔMean 298
ΔMean 461
ΔMean < 100
ΔMean < 251
ΔMean < 355

Figure 170



Phase contrast Microscopy

Immuno-electronmicroscopy
(Immunogold Negative Staining,
1° α-80, 2° α-mouse gold particles 10nm)

Figure 171

Gel filtration on Sepharyl HR 400

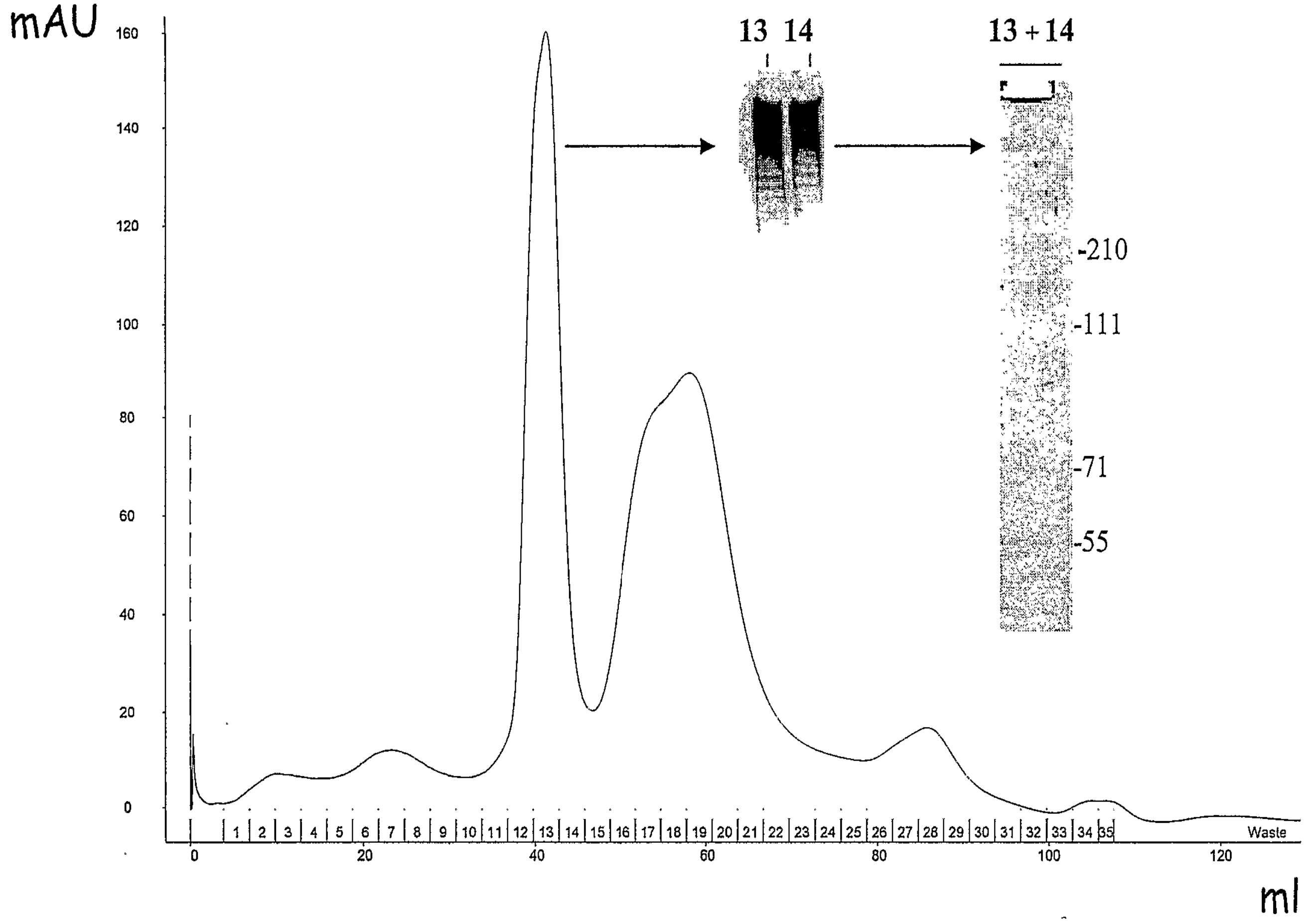


Figure 172

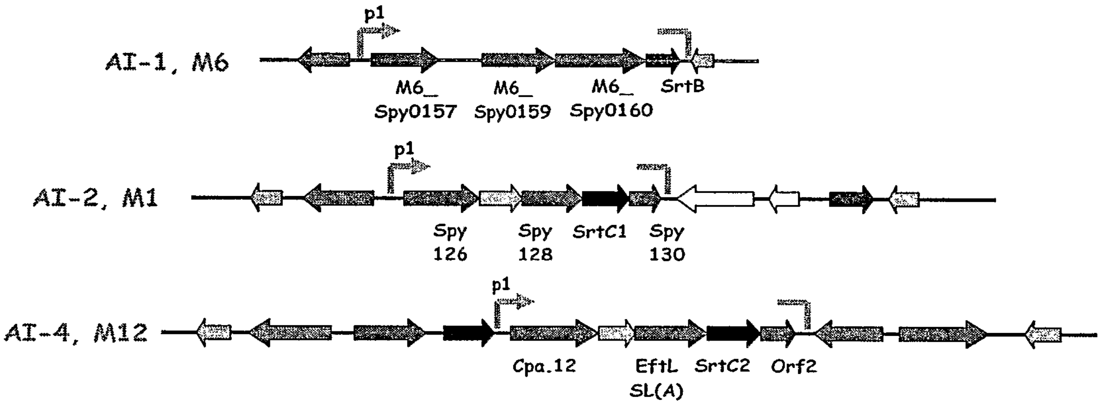
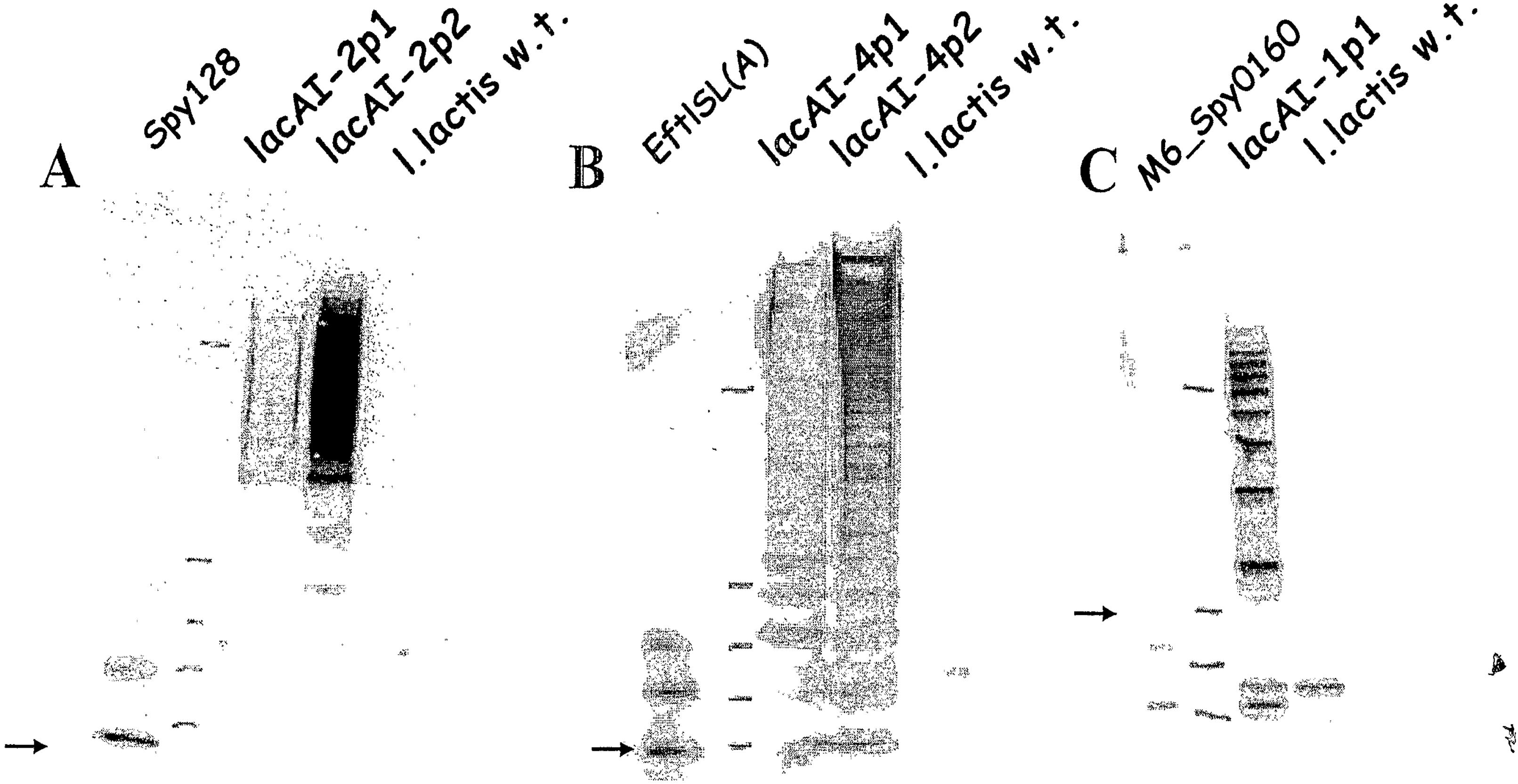

AI-1, M6
p1
M6_ Spy0157
M6_ Spy0159
M6_ Spy0160
SrtB
AI-2, M1
p1
Spy 126
Spy 128
SrtC1
Spy 130
AI-4, M12
p1
Cpa.12
EftL SL(A)
SrtC2
Orf2

Figure 173

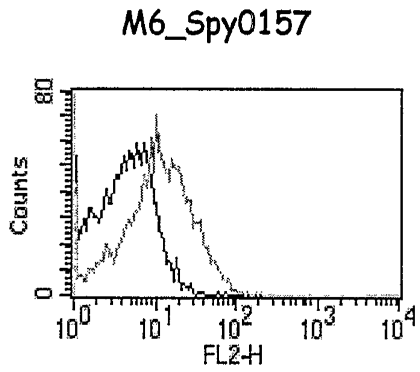


Ab-Spy128
AI-2 (M1) in l.lactis

Ab-EftlSL(A)
AI-4 (M12) in l.lactis

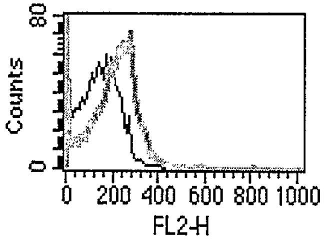
Ab-M6_Spy0160
AI-1 (M6) in l.lactis

Figure 174



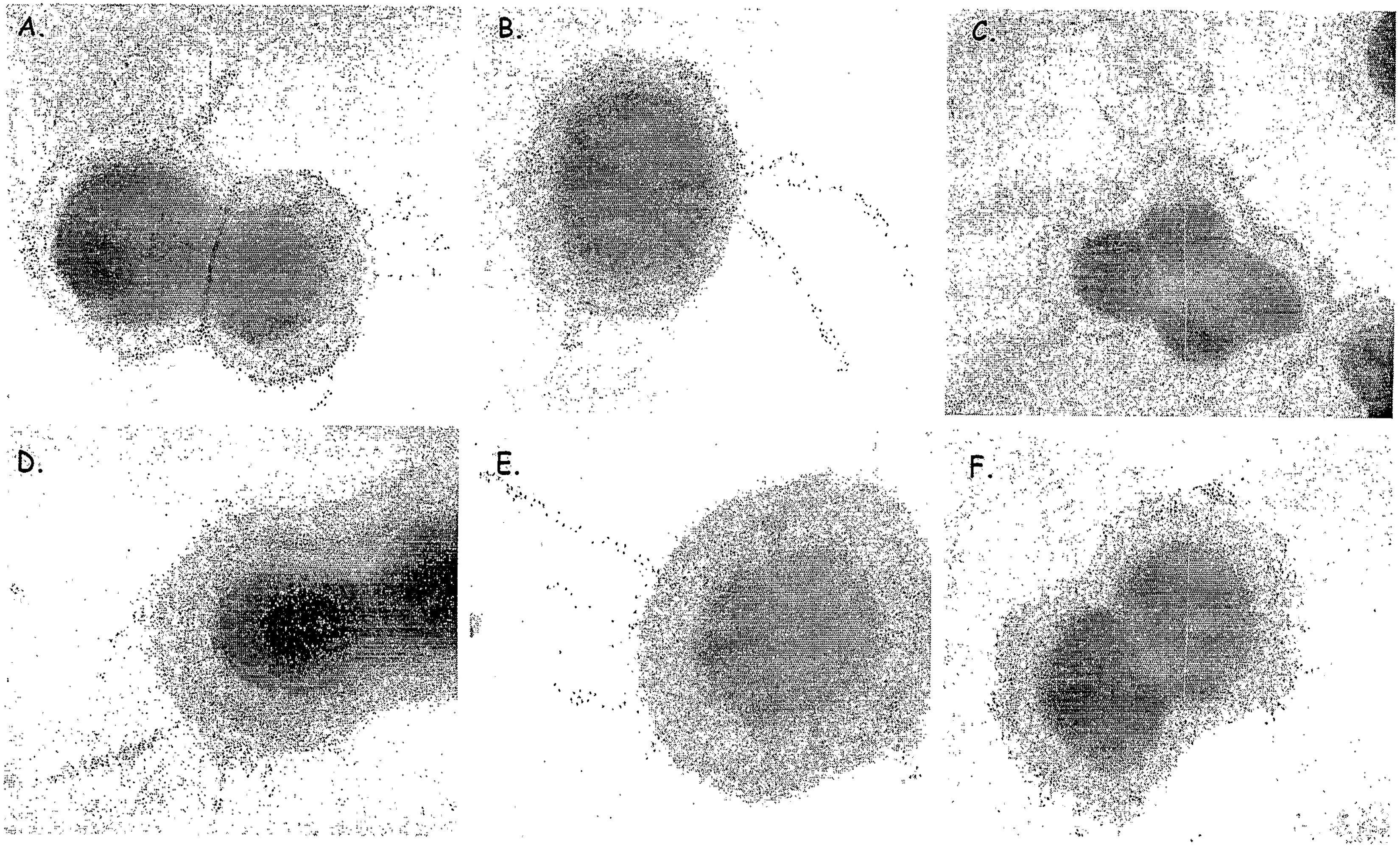
373/487

Figure 175



Orf2

Figure 176



Immuno-gold labeling with antibodies against: A. B. C. D. E. M6_Spy0160; F. M6_Spy0159

Figure 177

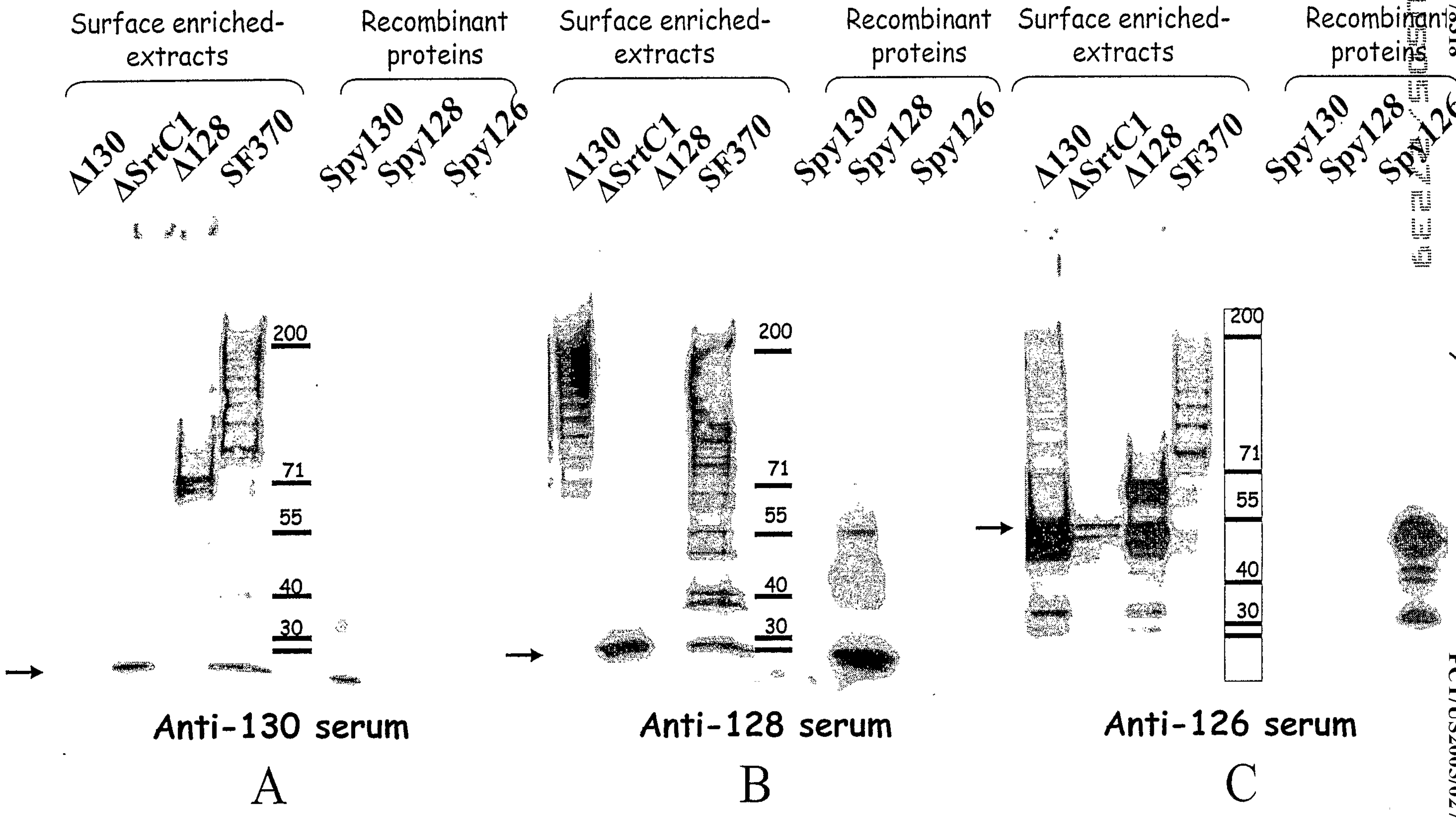
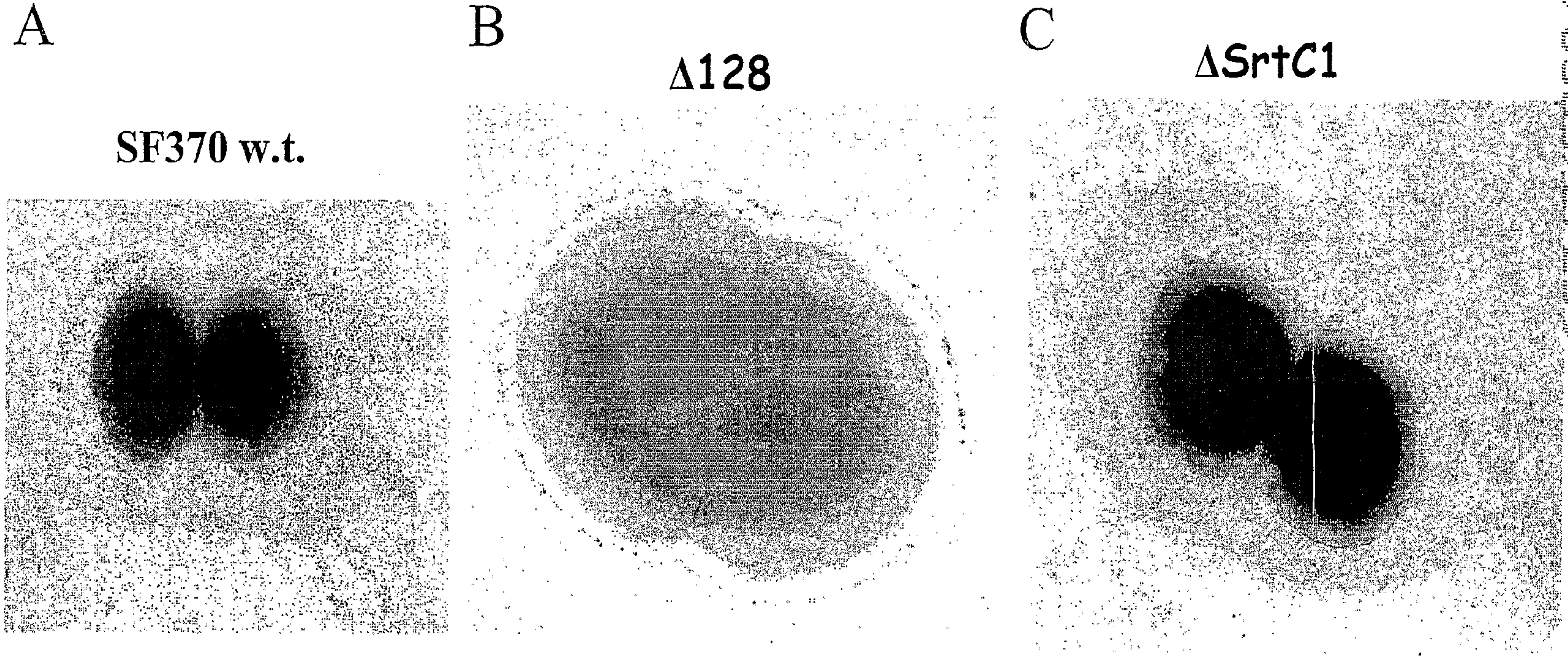

Surface enriched-extracts
Δ130
ΔSrtC1
Δ128
SF370
Recombinant proteins
Spy130
Spy128
Spy126
200
71
55
40
30
Anti-130 serum
A
Anti-128 serum
B
Anti-126 serum
C

Figure 178



Immuno-gold labeling with sera against Spy128

Comparison of wild type and mutant strain by Immunoelectron Microscopy show that **Spy128- or SrtC1-lacking bacteria are not able to assemble pili. SrtC1, therefore, is absolutely required for pilus assembly but not for surface anchoring.**

Figure 179

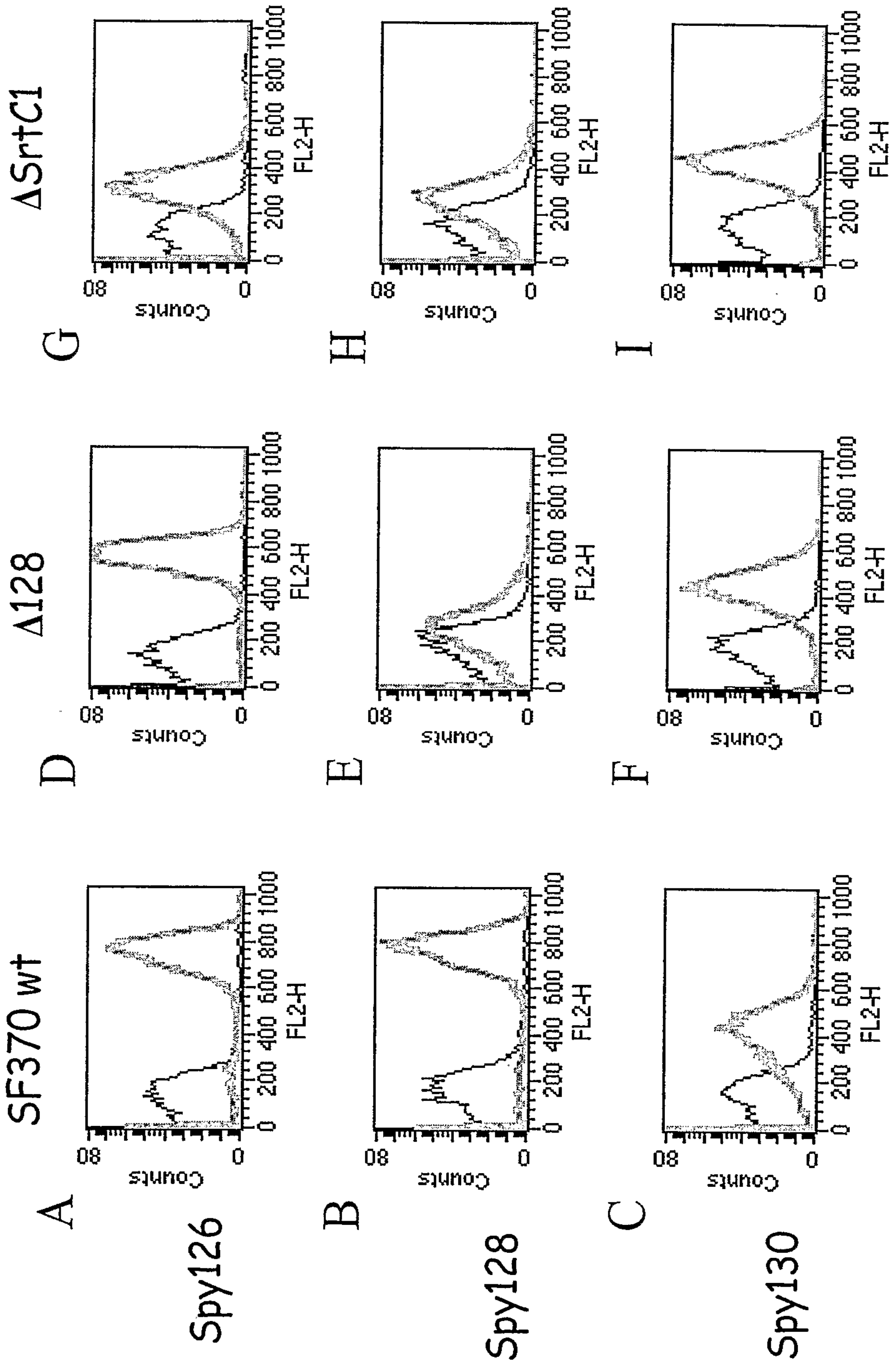

SF370 wt
Δ128
ΔSrtC1
Spy126
Spy128
Spy130
A
B
C
D
E
F
G
H
I
Counts
80
0
FL2-H
0
200
400
600
800
1000

Figure 180

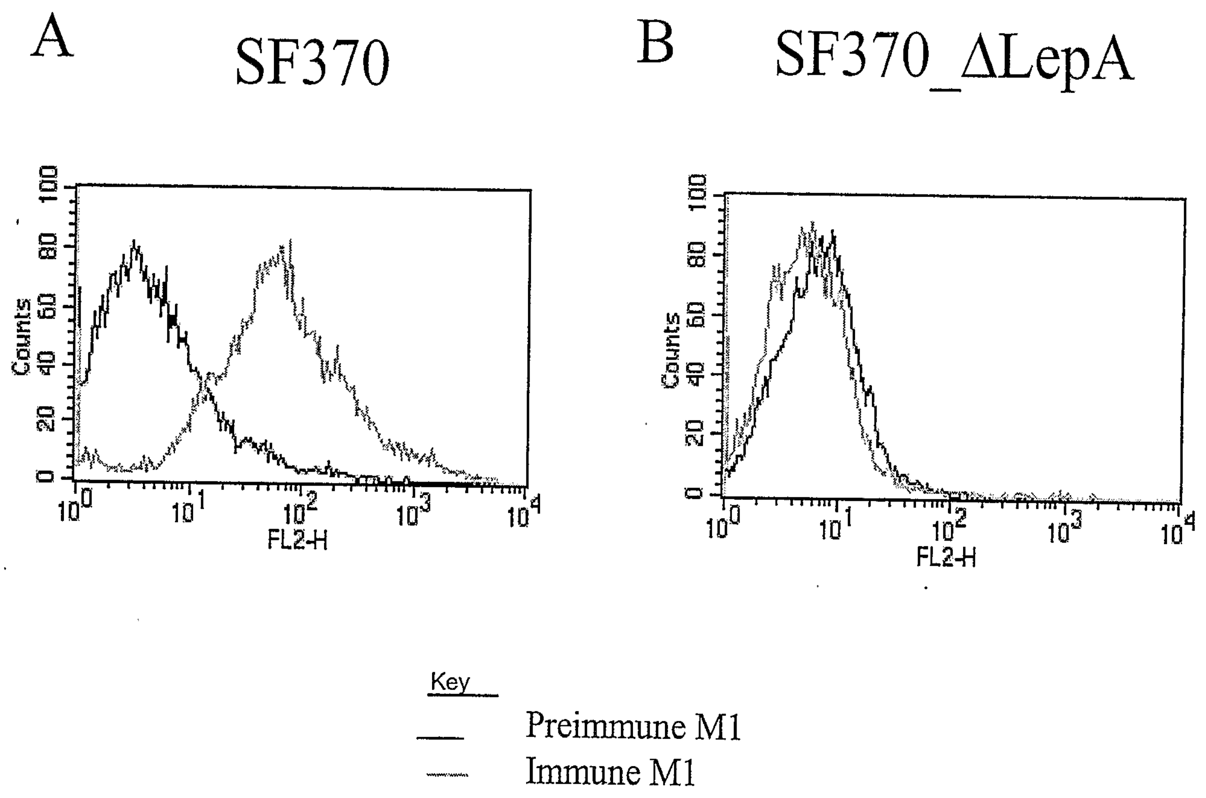
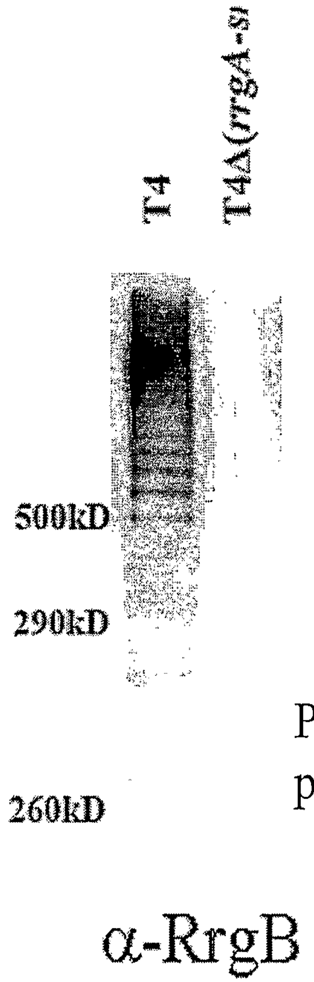
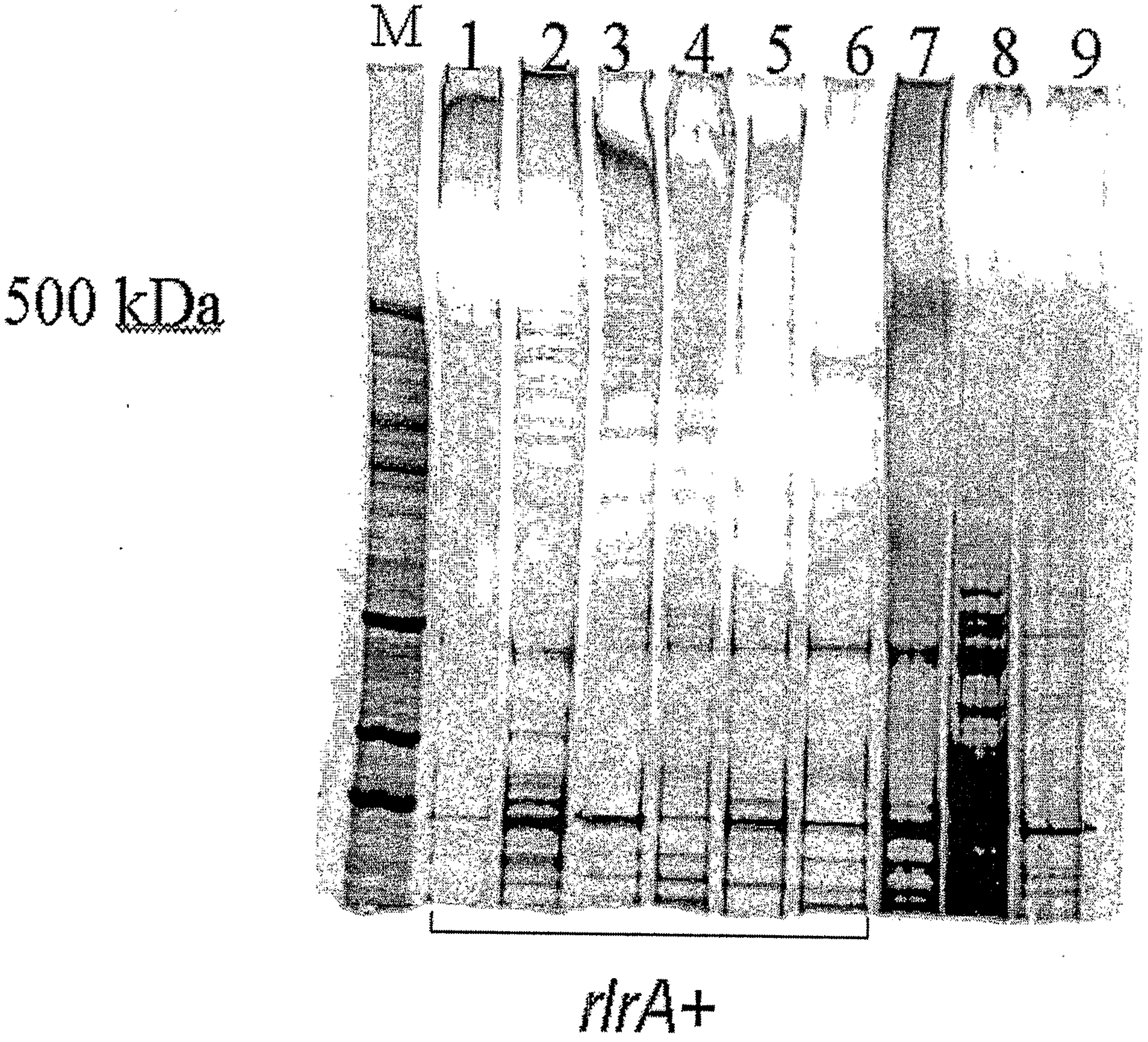

A
SF370
B
SF370_ΔLepA
Counts
0
20
40
60
80
100
10^0
10^1
10^2
10^3
10^4
FL2-H
Key
Preimmune M1
Immune M1

Figure 181



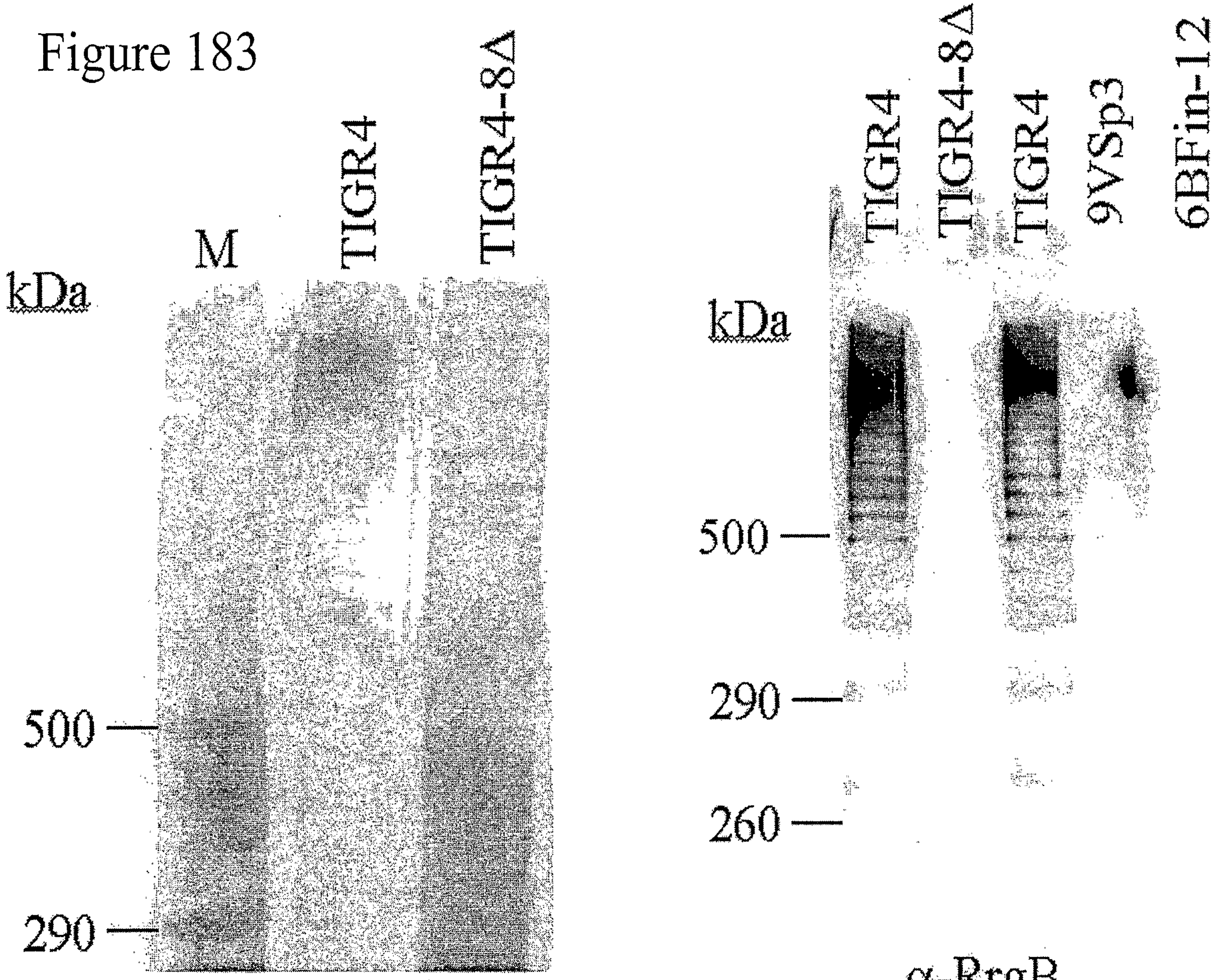
Pili form high molecular weight
polymers in gradient SDS-PAGE gels

Figure 182



1.TIGR4
2. 19A Hungary-6
3. 6B Finland-12
4. 6B IJ
5. 9V Spain-3
6. 23F Taiwan-15
7. 19F IJ
8. 1 IJ
9. D39

Figure 183



Silver stained gel 3-8%

α-RrgB

Anti-RrgB TIGR4 recognized the 9v pili

PCT/US05/27239

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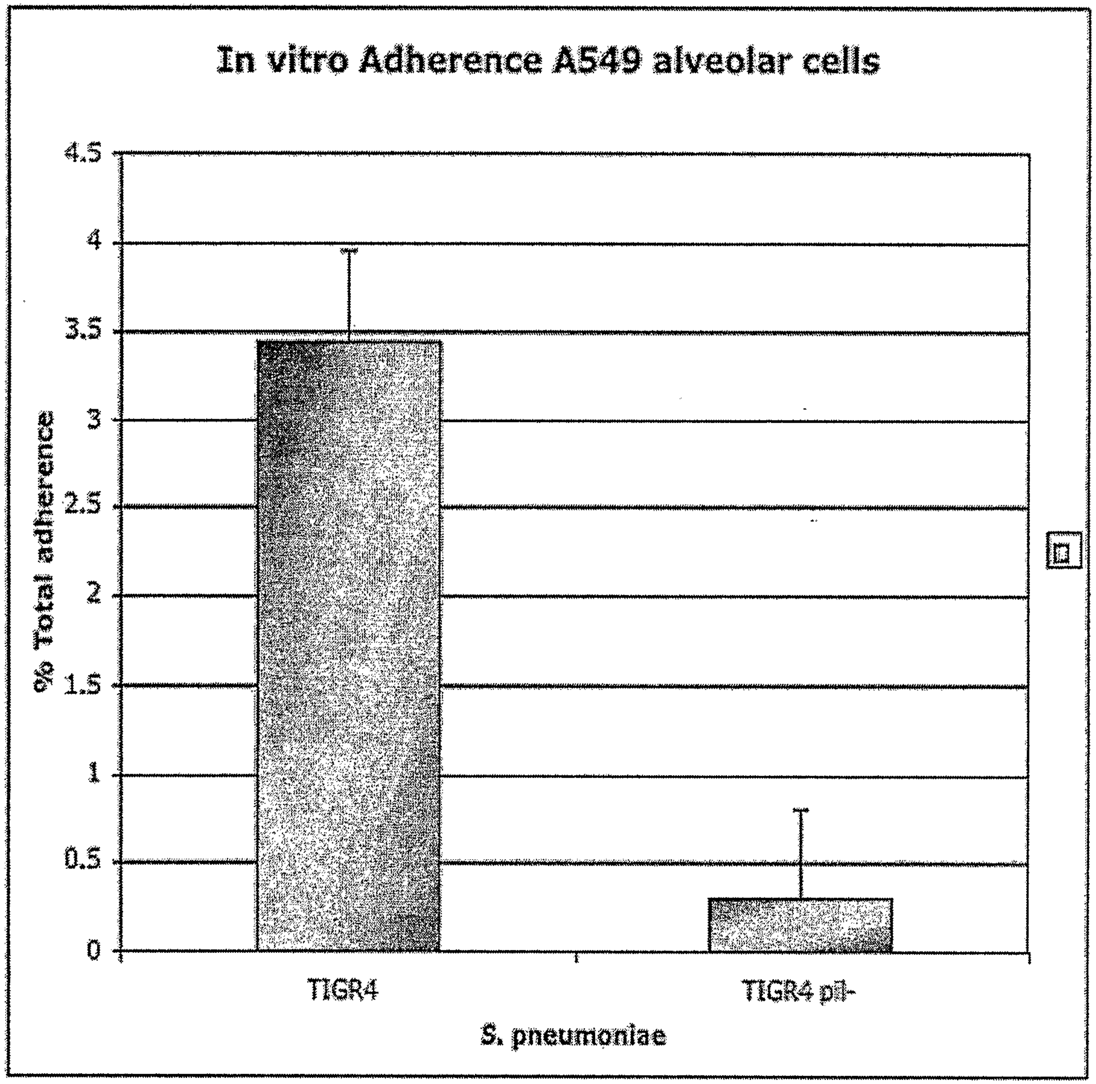
Figure 184



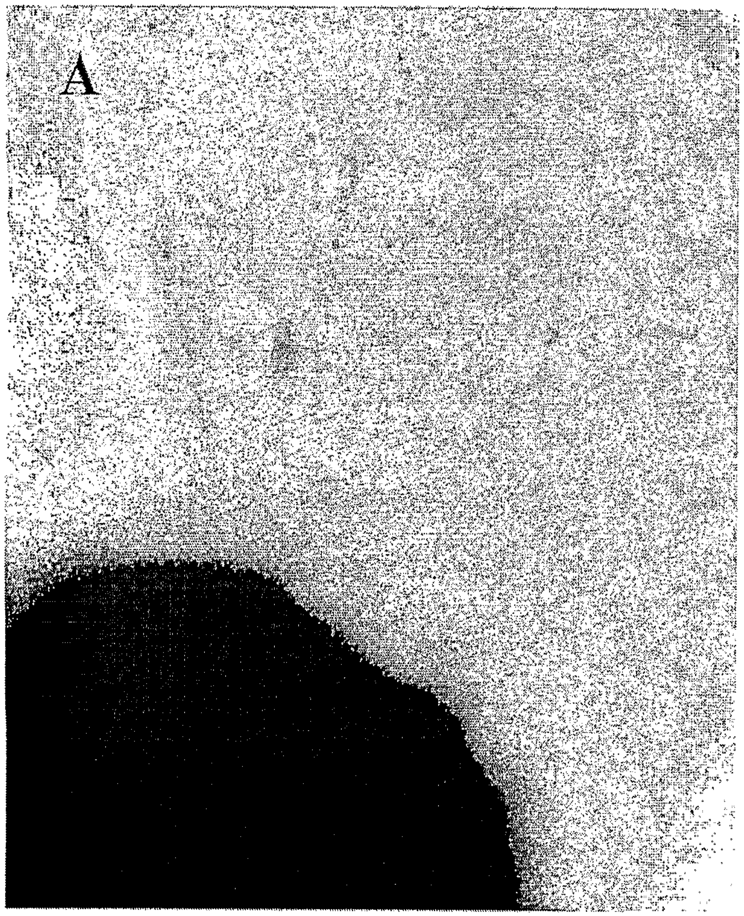


Figure 185

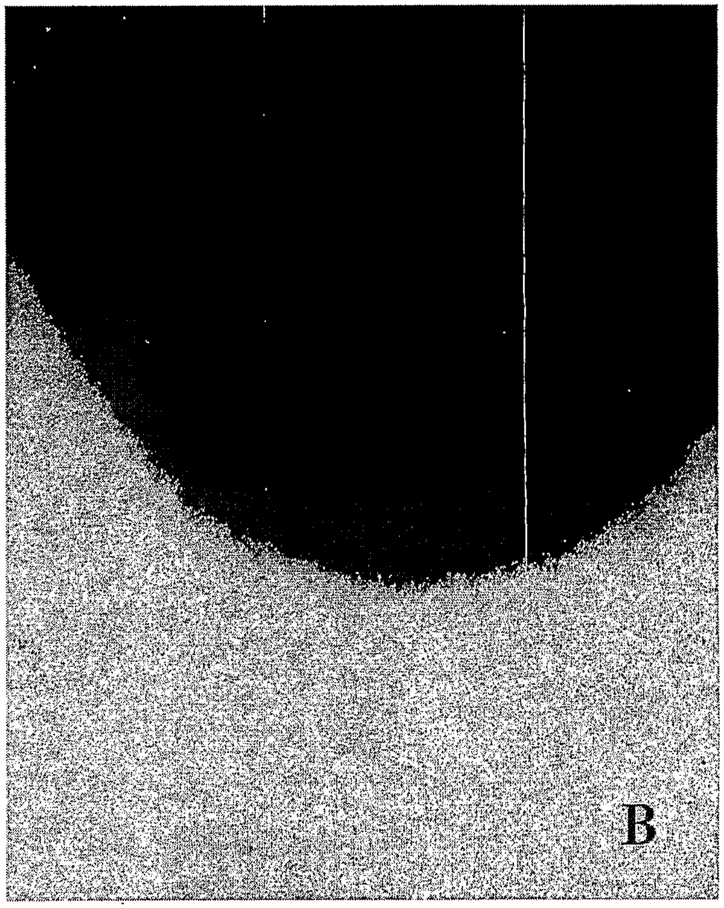


Figure 186

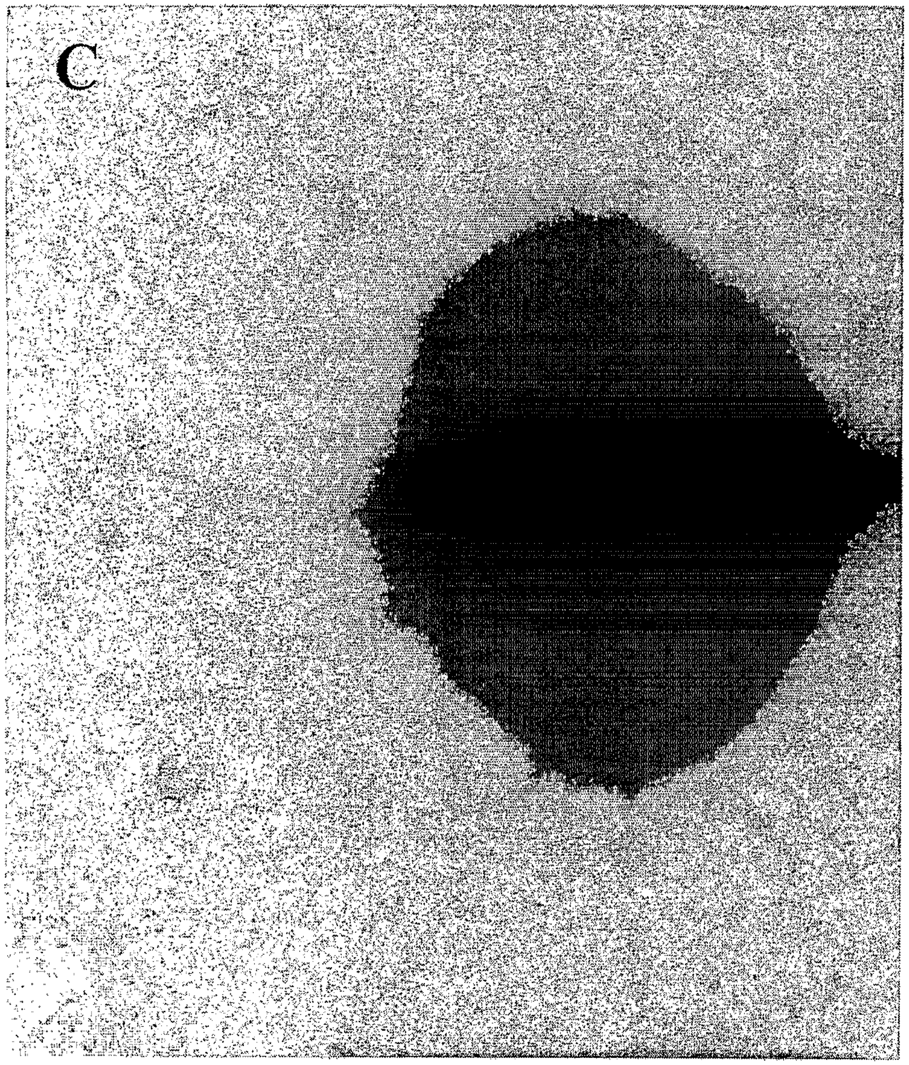


Figure 187

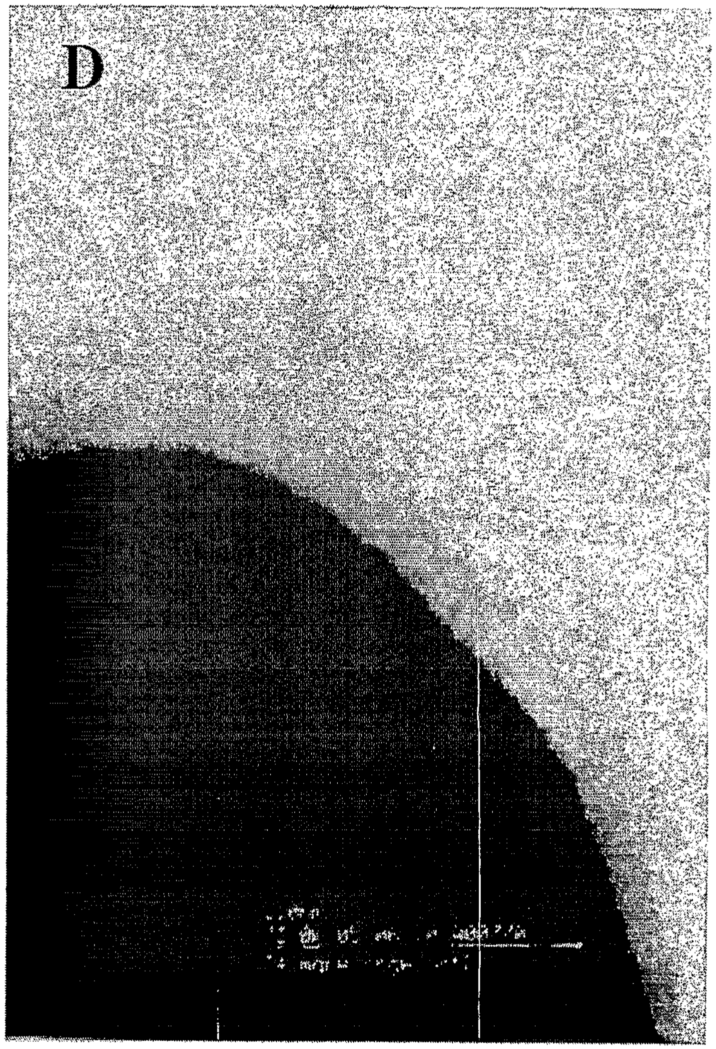


Figure 188

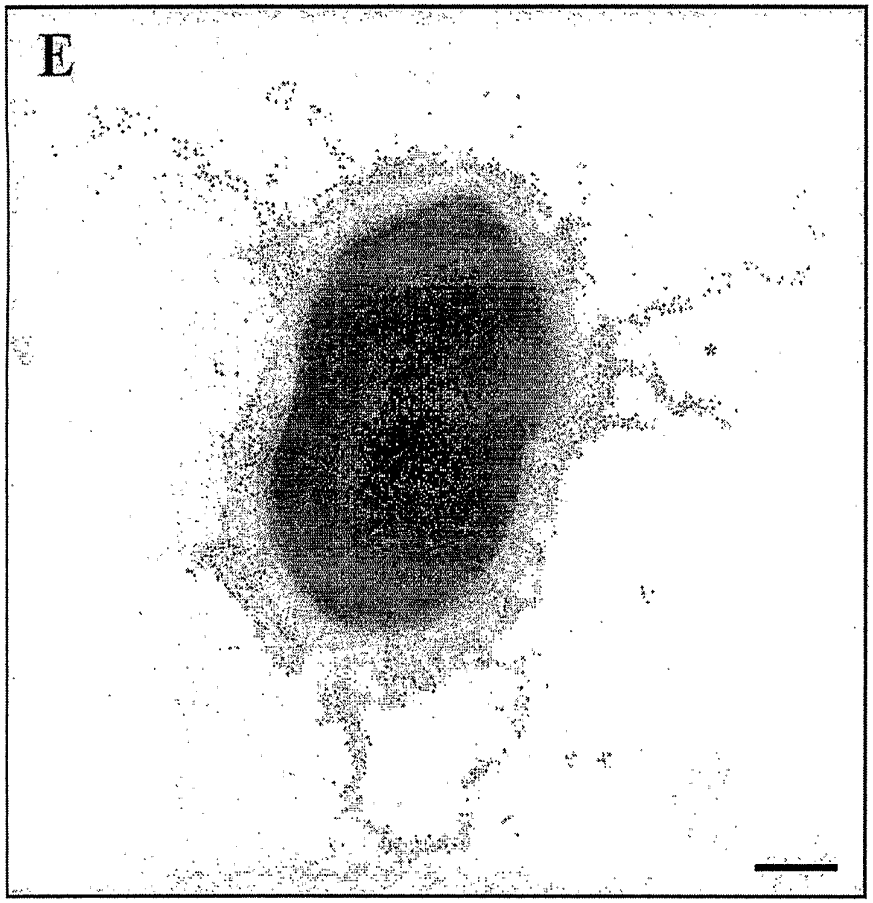


Figure 189

Figure 190

S. pneumoniae pili proteins: sp0462 (Rrg.A)

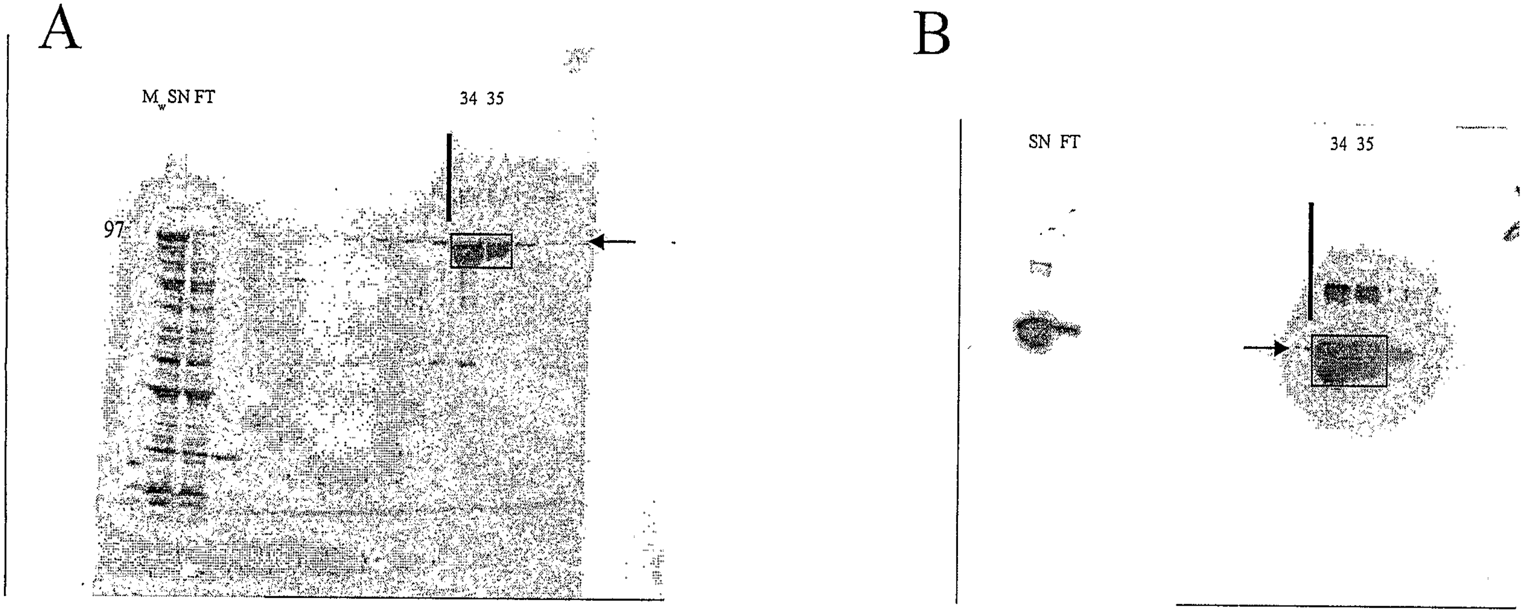
Expression and purification:

- pET 21b+-*rrg.A-6*
- purified in soluble form (stored at –80°C; in NaCl $_{\text{physiol.}}$)

⇨

Results:

- protein conc.: 1,1 mg/ml



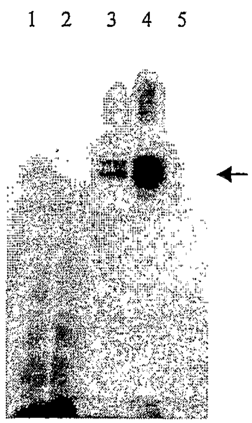
SDS-page

Western blot (anti-HIS)

S. pneumoniae pili proteins – antibody production (mice)

Sp0463 (rrgB):

α-rrgB (1/10000)

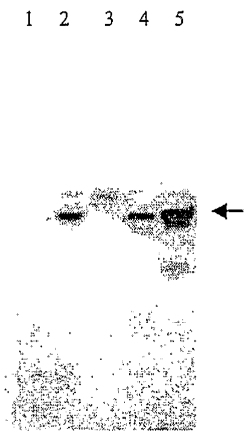


1: rrgB (E.coli background)
2: rrgC (E.coli background)
3: rrgB purified 1 µl
4: rrgB purified 5 µl
5: rrgC purified 5 µl

Figure 191

S. pneumoniae pili proteins – antibody production (mice)

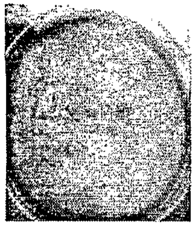
Sp0464 (rrgC):



1: rrgB (E.coli background)
2: rrgC (E.coli background)
3: rrgB purified 5 µl
4: rrgC purified 1 µl
5: rrgC purified 5 µl

Figure 192

S. pneumoniae TIGR4 pilus purification I – cultivation + digestion



***S.pneumoniae* TIGR4**
Blood plates
ON/37°C/13h

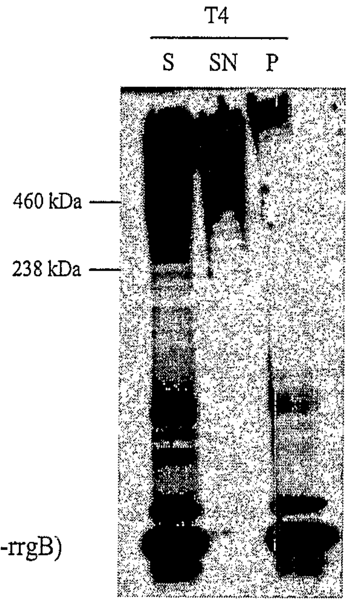
- Resuspension in PBS/washing
- **Resuspension in PPB** (4-6 plates/ml) (20% sucrose, 10mM $MgCl_2$, 50mM NaPPi pH6,3)

- **Digestion with Mutanolysin** (N-Acetyl Muramidase) 37°C, ~10 h

Pellet

SN

Sucrose Density gradient centrifugation



Western (1.AK. α-rrgB)

Figure 193

S. pneumoniae TIGR4 pilus purification II - Sucrose density gradient centrifugation

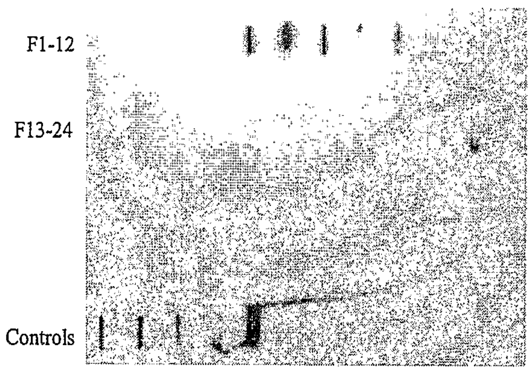
950µl SN
25-56% linear sucrose gradient
SW40; 38000, 4°C, 16h

⬇

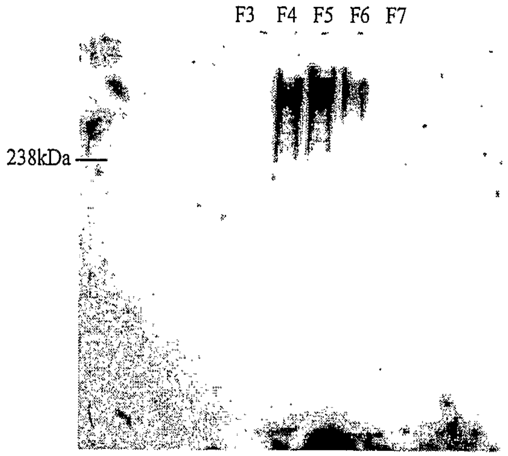
24 x 500 µl fractions
(Gradient master)

⬇

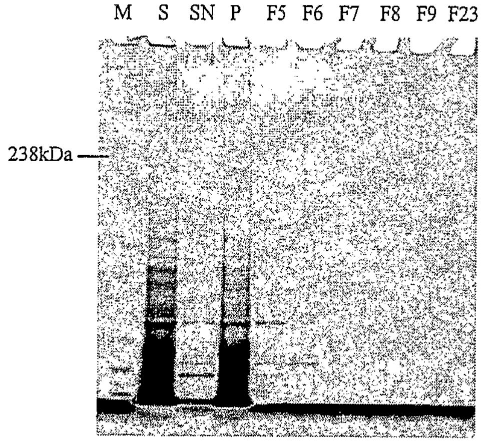
Gel filtration



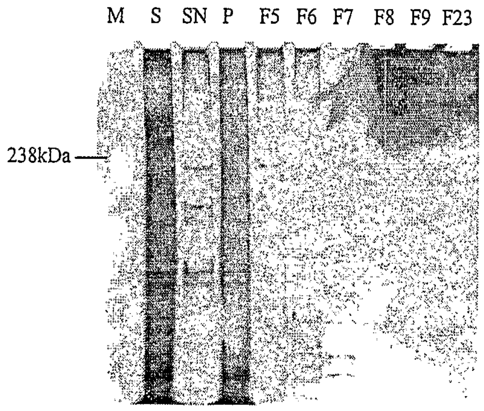
Slot blot (fractions sucrose grad.)



Western (1.AK. α-rrgB)



Coomassie staining

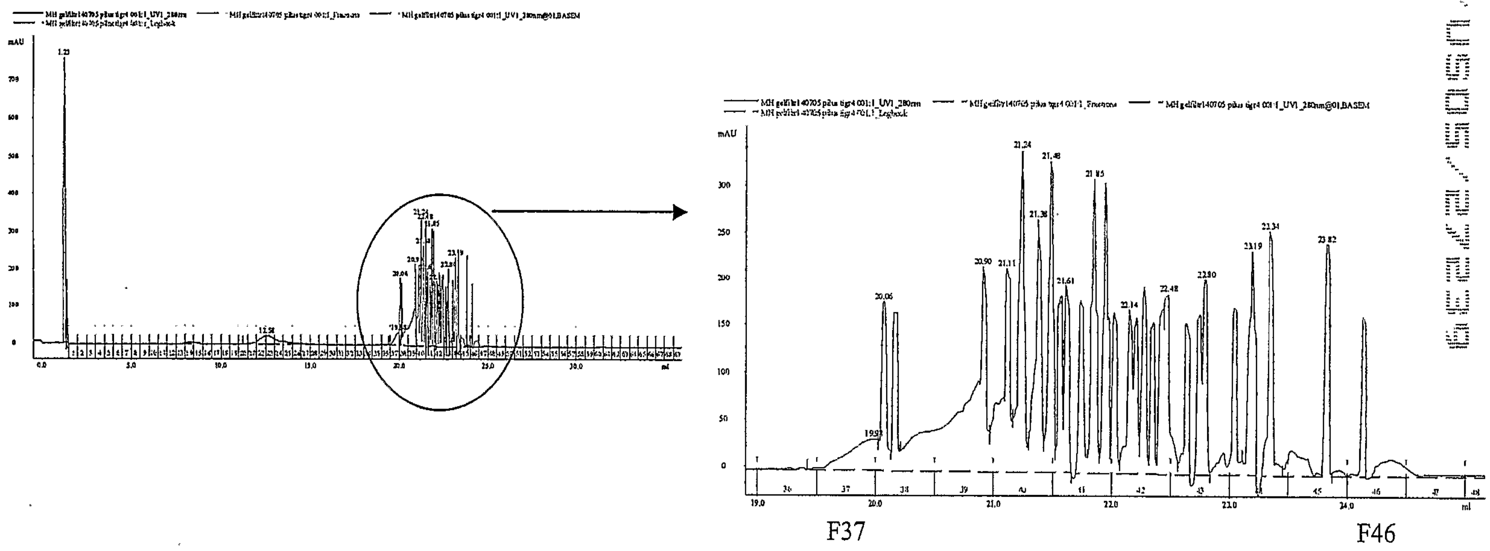


Silver Staining

Figure 194

S. pneumoniae TIGR4 pilus purification III – Gel filtration

400 µl Fr.5
Superdex 200



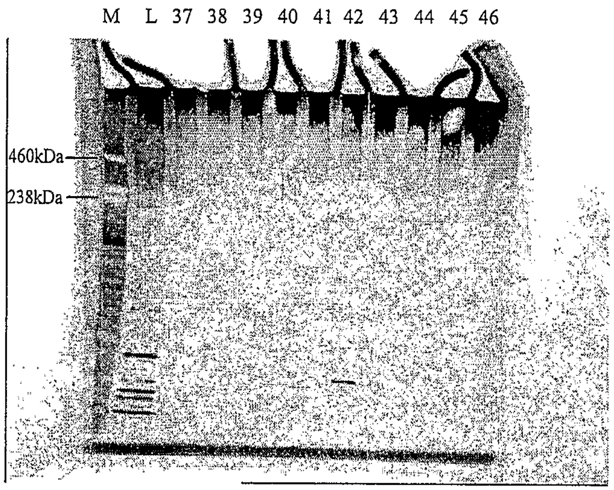


Figure 195

```
14CSR          ------GTTTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC
670            TGAGTTGTTTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC
6BF            ------GTTTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC
6BSP           ------------GCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC
19AH           ------GTTTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC
23FPO          -------TTTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC
19FTW          ----------------TTTTCATTATAAATCTTATGGGACTTTTTTGATACTCAAAAAGC
9VSP           -------TTTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC
TIGR4          --------TTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC
23FTW          ------------GCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC
                               ************ *******************************

14CSR          CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAAACACT
670            CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAAACACT
6BF            CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAAACACT
6BSP           CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAAACACT
19AH           CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAAACACT
23FPO          CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAAACACT
19FTW          CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAAACACT
9VSP           CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAAACACT
TIGR4          CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAAACACT
23FTW          CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAAACACT
               ************************************************************

14CSR          TTTGTTCACTAGCAGAAACTAGAGAGCAGAAGTGTTTTTCTGTTCAGATTTACCCAAAAC
670            TTTGTTCACTAGCAGAAACTAGAGAGCAGAAGTGTTTTTCTGTTCAGATTTACCCAAAAC
6BF            TTTGTTCACTAGCAGAAACTAGAGAGCAGAAGTGTTTTTCTGTTCAGATTTACCCAAAAC
6BSP           TTTGTTCACTAGCAGAAACTAGAGAGCAGAAGTGTTTTTCTGTTCAGATTTACCCAAAAC
19AH           TTTGTTCACTAGCAGAAACTAGAGAGCAGAAGTGTTTTTCTGTTCAGATTTACCCAAAAC
23FPO          TTTGTTCACTAGCAGAAACTAGAGAGCAGAAGTGTTTTTCTGTTCAGATTTACCCAAAAC
19FTW          TTTGTTCACTAGCAGAAACTAGAGAGCAGAAGTGTTTTTCTGTTCAGATTTACCCAAAAC
9VSP           TTTGTTCACTAGCAGAAACTAGAGAGCAGAAGTGTTTTTCTGTTCAGATTTACCCAAAAC
TIGR4          TTTGTTCACTAGCAGAAACTAGAGAGCAGAAGTGTTTTTCTGTTCAGATTTACCCAAAAC
23FTW          TTTGTTCACTAGCAGAAACTAGAGAGCAGAAGTGTTTTTCTGTTCAGATTTACCCAAAAC
               ************************************************************

14CSR          TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCTTTTTGTGTGTAGACAG
670            TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCTTTTTGTGTGTAGACAG
6BF            TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCTTTTTGTGTGTAGACAG
6BSP           TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCTTTTTGTGTGTAGACAG
19AH           TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCTTTTTGTGTGTAGACAG
23FPO          TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCTTTTTGTGTGTAGACAG
19FTW          TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCTTTTTGTGTGTAGACAG
9VSP           TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCTTTTTGTGTGTAGACAG
TIGR4          TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCTTTTTGTGTGTAGACAG
23FTW          TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCTTTTTGTGTGTAGACAG
               ************************************************************

14CSR          TACGATGAACTTATAACAAATAGTGAGCCTTTTTAGCAATCATTGCGACCCGTTTGTCAA
670            TACGATGAACTTATAACAAATAGTGAGCCTTTTTAGCAATCATTGCGACCCGTTTGTCAA
6BF            TACGATGAACTTATAACAAATAGTGAGCCTTTTTAGCAATCATTGCGACCCGTTTGTCAA
6BSP           TACGATGAACTTATAACAAATAGTGAGCCTTTTTAGCAATCATTGCGACCCGTTTGTCAA
19AH           TACGATGAACTTATAACAAATAGTGAGCCTTTTTAGCAATCATTGCGACCCGTTTGTCAA
23FPO          TACGATGAACTTATAACAAATAGTGAGCCTTTTTAGCAATCATTGCGACCCGTTTGTCAA
19FTW          TACGATGAACTTATAACAAATAGTGAGCCTTTTTAGCAATCATTGCGACCCGTTTGTCAA
9VSP           TACGATGAACTTATAACAAATAGTGAGCCTTTTTAGCAATCATTGCGACCCGTTTGTCAA
TIGR4          TACGATGAACTTATAACAAATAGTGAGCCTTTTTAGCAATCATTGCGACCCGTTTGTCAA
23FTW          TACGATGAACTTATAACAAATAGTGAGCCTTTTTAGCAATCATTGCGACCCGTTTGTCAA
               ************************************************************
```

Figure 196A

```
14CSR          AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA
670            AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA
6BF            AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA
6BSP           AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA
19AH           AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA
23FPO          AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA
19FTW          AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA
9VSP           AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA
TIGR4          AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA
23FTW          AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA
               ************************************************************

14CSR          AATCTAAGGCAATCGTCAAAAAGTGATGTTTCCCTTTGGGATACTGCTTTTTAACGTAAG
670            AATCTAAGGCAATCGTCAAAAAGTGATGTTTCCCTTTGGGATACTGCTTTTTAACGTAAG
6BF            AATCTAAGGCAATCGTCAAAAAGTGATGTTTCCCTTTGGGATACTGCTTTTTAACGTAAG
6BSP           AATCTAAGGCAATCGTCAAAAAGTGATGTTTCCCTTTGGGATACTGCTTTTTAACGTAAG
19AH           AATCTAAGGCAATCGTCAAAAAGTGATGTTTCCCTTTGGGATACTGCTTTTTAACGTAAG
23FPO          AATCTAAGGCAATCGTCAAAAAGTGATGTTTCCCTTTGGGATACTGCTTTTTAACGTAAG
19FTW          AATCTAAGGCAATCGTCAAAAAGTGATGTTTCCCTTTGGGATACTGCTTTTTAACGTAAG
9VSP           AATCTAAGGCAATCGTCAAAAAGTGATGTTTCCCTTTGGGATACTGCTTTTTAACGTAAG
TIGR4          AATCTAAGGCAATCGTCAAAAAGTGATGTTTCCCTTTGGGATACTGCTTTTTAACGTAAG
23FTW          AATCTAAGGCAATCGTCAAAAAGTGATGTTTCCCTTTGGGATACTGCTTTTTAACGTAAG
               ************************************************************

14CSR          GCAGGTATTCTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG
670            GCAGGTATTCTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG
6BF            GCAGGTATTCTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG
6BSP           GCAGGTATTCTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG
19AH           GCAGGTATTCTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG
23FPO          GCAGGTATTCTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG
19FTW          GCAGGTATTCTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG
9VSP           GCAGGTATTCTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG
TIGR4          GCAGGTATTCTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG
23FTW          GCAGGTATTCTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG
               ************************************************************

14CSR          GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTCAGTAAAATTCCGTA
670            GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTCAGTAAAATTCCGTA
6BF            GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTCAGTAAAATTCCGTA
6BSP           GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTCAGTAAAATTCCGTA
19AH           GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTCAGTAAAATTCCGTA
23FPO          GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTCAGTAAAATTCCGTA
19FTW          GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTCAGTAAAATTCCGTA
9VSP           GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTCAGTAAAATTCCGTA
TIGR4          GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTCAGTAAAATTCCGTA
23FTW          GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTCAGTAAAATTCCGTA
               ************************************************************

14CSR          AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAAATCGGA
670            AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAAATCGGA
6BF            AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAAATCGGA
6BSP           AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAAATCGGA
19AH           AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAAATCGGA
23FPO          AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAAATCGGA
19FTW          AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAAATCGGA
9VSP           AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAAATCGGA
TIGR4          AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAAATCGGA
23FTW          AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAAATCGGA
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Figure 196B

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14CSR           TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT
670             TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT
6BF             TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT
6BSP            TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT
19AH            TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT
23FPO           TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT
19FTW           TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT
9VSP            TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT
TIGR4           TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT
23FTW           TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT
                ************************************************************

14CSR           GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTCG
670             GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTCG
6BF             GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTCG
6BSP            GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTCG
19AH            GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTCG
23FPO           GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTCG
19FTW           GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTCG
9VSP            GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTCG
TIGR4           GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTCG
23FTW           GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTCG
                ************************************************************

14CSR           AAATATGATACAGTGGCTTGTCGCTTTCAATCCCATAATGTTCGTAATAATTATAATAGG
670             AAATATGATACAGTGGCTTGTCGCTTTCAATCCCATAATGTTCGTAATAATTATAATAGG
6BF             AAATATGATACAGTGGCTTGTCGCTTTCAATCCCATAATGTTCGTAATAATTATAATAGG
6BSP            AAATATGATACAGTGGCTTGTCGCTTTCAATCCCATAATGTTCGTAATAATTATAATAGG
19AH            AAATATGATACAGTGGCTTGTCGCTTTCAATCCCATAATGTTCGTAATAATTATAATAGG
23FPO           AAATATGATACAGTGGCTTGTCGCTTTCAATCCCATAATGTTCGTAATAATTATAATAGG
19FTW           AAATATGATACAGTGGCTTGTCGCTTTCAATCCCATAATGTTCGTAATAATTATAATAGG
9VSP            AAATATGATACAGTGGCTTGTCGCTTTCAATCCCATAATGTTCGTAATAATTATAATAGG
TIGR4           AAATATGATACAGTGGCTTGTCGCTTTCAATCCCATAATGTTCGTAATAATTATAATAGG
23FTW           AAATATGATACAGTGGCTTGTCGCTTTCAATCCCATAATGTTCGTAATAATTATAATAGG
                ************************************************************

14CSR           GAACTAGATTTTGTAAACCAAACAAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA
670             GAACTAGATTTTGTAAACCAAACAAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA
6BF             GAACTAGATTTTGTAAACCAAACAAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA
6BSP            GAACTAGATTTTGTAAACCAAACAAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA
19AH            GAACTAGATTTTGTAAACCAAACAAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA
23FPO           GAACTAGATTTTGTAAACCAAACAAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA
19FTW           GAACTAGATTTTGTAAACCAAACAAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA
9VSP            GAACTAGATTTTGTAAACCAAACAAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA
TIGR4           GAACTAGATTTTGTAAACCAAACAAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA
23FTW           GAACTAGATTTTGTAAACCAAACAAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA
                ************************************************************

14CSR           AAGAAAGAGAATTCGAAATGTCATTTCCTAAGATATTCTTGAACTTGGATAGTAGATGCT
670             AAGAAAGAGAATTCGAAATGTCATTTCCTAAGATATTCTTGAACTTGGATAGTAGATGCT
6BF             AAGAAAGAGAATTCGAAATGTCATTTCCTAAGATATTCTTGAACTTGGATAGTAGATGCT
6BSP            AAGAAAGAGAATTCGAAATGTCATTTCCTAAGATATTCTTGAACTTGGATAGTAGATGCT
19AH            AAGAAAGAGAATTCGAAATGTCATTTCCTAAGATATTCTTGAACTTGGATAGTAGATGCT
23FPO           AAGAAAGAGAATTCGAAATGTCATTTCCTAAGATATTCTTGAACTTGGATAGTAGATGCT
19FTW           AAGAAAGAGAATTCGAAATGTCATTTCCTAAGATATTCTTGAACTTGGATAGTAGATGCT
9VSP            AAGAAAGAGAATTCGAAATGTCATTTCCTAAGATATTCTTGAACTTGGATAGTAGATGCT
TIGR4           AAGAAAGAGAATTCGAAATGTCATTTCCTAAGATATTCTTGAACTTGGATAGTAGATGCT
23FTW           AAGAAAGAGAATTCGAAATGTCATTTCCTAAGATATTCTTGAACTTGGATAGTAGATGCT
                ************************************************************
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Figure 196C

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14CSR          TTCCTCTTGTATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT
670            TTCCTCTTGTATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT
6BF            TTCCTCTTGTATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT
6BSP           TTCCTCTTGTATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT
19AH           TTCCTCTTGTATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT
23FPO          TTCCTCTTGTATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT
19FTW          TTCCTCTTGTATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT
9VSP           TTCCTCTTGTATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT
TIGR4          TTCCTCTTGTATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT
23FTW          TTCCTCTTGTATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT
               ************************************************************

14CSR          TGTCCTTGGAAAACGAAGAATTAGCAGAACAATAAACCAAAAAGATATAATCCAGTTCTT
670            TGTCCTTGGAAAACGAAGAATTAGCAGAACAATAAACCAAAAAGATATAATCCAGTTCTT
6BF            TGTCCTTGGAAAACGAAGAATTAGCAGAACAATAAACCAAAAAGATATAATCCAGTTCTT
6BSP           TGTCCTTGGAAAACGAAGAATTAGCAGAACAATAAACCAAAAAGATATAATCCAGTTCTT
19AH           TGTCCTTGGAAAACGAAGAATTAGCAGAACAATAAACCAAAAAGATATAATCCAGTTCTT
23FPO          TGTCCTTGGAAAACGAAGAATTAGCAGAACAATAAACCAAAAAGATATAATCCAGTTCTT
19FTW          TGTCCTTGGAAAACGAAGAATTAGCAGAACAATAAACCAAAAAGATATAATCCAGTTCTT
9VSP           TGTCCTTGGAAAACGAAGAATTAGCAGAACAATAAACCAAAAAGATATAATCCAGTTCTT
TIGR4          TGTCCTTGGAAAACGAAGAATTAGCAGAACAATAAACCAAAAAGATATAATCCAGTTCTT
23FTW          TGTCCTTGGAAAACGAAGAATTAGCAGAACAATAAACCAAAAAGATATAATCCAGTTCTT
               ************************************************************

14CSR          CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
670            CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
6BF            CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
6BSP           CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
19AH           CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
23FPO          CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
19FTW          CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
9VSP           CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
TIGR4          CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
23FTW          CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
               ************************************************************

14CSR          TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACTCTTTGGACTCAGGGAACTCAAGTG
670            TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACTCTTTGGACTCAGGGAACTCAAGTG
6BF            TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACTCTTTGGACTCAGGGAACTCAAGTG
6BSP           TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACTCTTTGGACTCAGGGAACTCAAGTG
19AH           TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACTCTTTGGACTCAGGGAACTCAAGTG
23FPO          TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACTCTTTGGACTCAGGGAACTCAAGTG
19FTW          TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACTCTTTGGACTCAGGGAACTCAAGTG
9VSP           TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACTCTTTGGACTCAGGGAACTCAAGTG
TIGR4          TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACTCTTTGGACTCAGGGAACTCAAGTG
23FTW          TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACTCTTTGGACTCAGGGAACTCAAGTG
               ************************************************************

14CSR          GAAATTCCCGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
670            GAAATTCCCGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
6BF            GAAATTCCCGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
6BSP           GAAATTCCCGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
19AH           GAAATTCCCGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
23FPO          GAAATTCCCGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
19FTW          GAAATTCCCGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
9VSP           GAAATTCCCGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
TIGR4          GAAATTCCCGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
23FTW          GAAATTCCCGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
               ************************************************************
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Figure 196D

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14CSR      GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA
670        GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA
6BF        GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA
6BSP       GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA
19AH       GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA
23FPO      GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA
19FTW      GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA
9VSP       GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA
TIGR4      GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA
23FTW      GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA
           ************************************************************

14CSR      CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAAATGAAACTGGAGGA
670        CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAAATGAAACTGGAGGA
6BF        CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAAATGAAACTGGAGGA
6BSP       CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAAATGAAACTGGAGGA
19AH       CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAAATGAAACTGGAGGA
23FPO      CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAAATGAAACTGGAGGA
19FTW      CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAAATGAAACTGGAGGA
9VSP       CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAAATGAAACTGGAGGA
TIGR4      CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAAATGAAACTGGAGGA
23FTW      CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAAATGAAACTGGAGGA
           ************************************************************

14CSR      GTGCAATTAAAAAACGAATGCGATATTCAGGACCAACTACTTGATTTTTCACAAGGTCCA
670        GTGCAATTAAAAAACGAATGCGATATTCAGGACCAACTACTTGATTTTTCACAAGGTCCA
6BF        GTGCAATTAAAAAACGAATGCGATATTCAGGACCAACTACTTGATTTTTCACAAGGTCCA
6BSP       GTGCAATTAAAAAACGAATGCGATATTCAGGACCAACTACTTGATTTTTCACAAGGTCCA
19AH       GTGCAATTAAAAAACGAATGCGATATTCAGGACCAACTACTTGATTTTTCACAAGGTCCA
23FPO      GTGCAATTAAAAAACGAATGCGATATTCAGGACCAACTACTTGATTTTTCACAAGGTCCA
19FTW      GTGCAATTAAAAAACGAATGCGATATTCAGGACCAACTACTTGATTTTTCACAAGGTCCA
9VSP       GTGCAATTAAAAAACGAATGCGATATTCAGGACCAACTACTTGATTTT-CACAAGGTCCA
TIGR4      GTGCAATTAAAAAACGAATGCGATATTCAGGACCAACTACTTGATTTTTCACAAGGTCCA
23FTW      GTGCAATTAAAAAACGAATGCGATATTCAGGACCAACTACTTGATTTTTCACAAGGTCCA
           ************************************************ ***********

14CSR      AACCTACTGAACGTAGTAACAAGCCACACTTTTGTCGTACGCGGTAGCCTGTTGCGATGG
670        AACCTACTGAACGTAGTAACAAGCCACACTTTTGTCGTACGCGGTAGCCTGTTGCGATGG
6BF        AACCTACTGAACGTAGTAACAAGCCACACTTTTGTCGTACGCGGTAGCCTGTTGCGATGG
6BSP       AACCTACTGAACGTAGTAACAAGCCACACTTTTGTCGTACGCGGTAGCCTGTTGCGATGG
19AH       AACCTACTGAACGTAGTAACAAGCCACACTTTTGTCGTACGCGGTAGCCTGTTGCGATGG
23FPO      AACCTACTGAACGTAGTAACAAGCCACACTTTTGTCGTACGCGGTAGCCTGTTGCGATGG
19FTW      AACCTACTGAACGTAGTAACAAGCCACACTTTTGTCGTACGCGGTAGCCTGTTGCGATGG
9VSP       AACCTACTGAACGTAGTAACAAGCCACACTTTTGTCGTACGCGGTAGCCTGTTGCGATGG
TIGR4      AACCTACTGAACGTAGTAACAAGCCACACTTTTGTCGTACGCGGTAGCCTGTTGCGATGG
23FTW      AACCTACTGAACGTAGTAACAAGCCACACTTTTGTCGTACGCGGTAGCCTGTTGCGATGG
           ************************************************************

14CSR      AAATATACTCTTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAAGAAGC
670        AAATATACTCTTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAAGAAGC
6BF        AAATATACTCTTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAAGAAGC
6BSP       AAATATACTCTTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAAGAAGC
19AH       AAATATACTCTTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAAGAAGC
23FPO      AAATATACTCTTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAAGAAGC
19FTW      AAATATACTCTTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAAGAAGC
9VSP       AAATATACTCTTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAAGAAGC
TIGR4      AAATATACTCTTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAAGAAGC
23FTW      AAATATACTCTTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAAGAAGC
           ************************************************************
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Figure 196E

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14CSR        GGAGTATTTTTAAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT
670          GGAGTATTTTTAAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT
6BF          GGAGTATTTTTAAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT
6BSP         GGAGTATTTTTAAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT
19AH         GGAGTATTTTTAAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT
23FPO        GGAGTATTTTTAAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT
19FTW        GGAGTATTTTTAAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT
9VSP         GGAGTATTTTTAAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT
TIGR4        GGAGTATTTTTAAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT
23FTW        GGAGTATTTTTAAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT
             ************************************************************

14CSR        GAGAATGGTGTTCGATTAATTGAACTTGTTGCGTATCTAAATTAAATGTCAACTCTTCCT
670          GAGAATGGTGTTCGATTAATTGAACTTGTTGCGTATCTAAATTAAATGTCAACTCTTCCT
6BF          GAGAATGGTGTTCGATTAATTGAACTTGTTGCGTATCTAAATTAAATGTCAACTCTTCCT
6BSP         GAGAATGGTGTTCGATTAATTGAACTTGTTGCGTATCTAAATTAAATGTCAACTCTTCCT
19AH         GAGAATGGTGTTCGATTAATTGAACTTGTTGCGTATCTAAATTAAATGTCAACTCTTCCT
23FPO        GAGAATGGTGTTCGATTAATTGAACTTGTTGCGTATCTAAATTAAATGTCAACTCTTCCT
19FTW        GAGAATGGTGTTCGATTAATTGAACTTGTTGCGTATCTAAATTAAATGTCAACTCTTCCT
9VSP         GAGAATGGTGTTCGATTAATTGAACTTGTTGCGTATCTAAATTAAATGTCAACTCTTCCT
TIGR4        GAGAATGGTGTTCGATTAATTGAACTTGTTGCGTATCTAAATTAAATGTCAACTCTTCCT
23FTW        GAGAATGGTGTTCGATTAATTGAACTTGTTGCGTATCTAAATTAAATGTCAACTCTTCCT
             ************************************************************

14CSR        CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA
670          CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA
6BF          CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA
6BSP         CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA
19AH         CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA
23FPO        CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA
19FTW        CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA
9VSP         CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA
TIGR4        CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA
23FTW        CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA
             ************************************************************

14CSR        AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA
670          AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA
6BF          AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA
6BSP         AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA
19AH         AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA
23FPO        AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA
19FTW        AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA
9VSP         AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA
TIGR4        AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA
23FTW        AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA
             ************************************************************

14CSR        TTTTATCTGTAATTCTTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC
670          TTTTATCTGTAATTCTTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC
6BF          TTTTATCTGTAATTCTTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC
6BSP         TTTTATCTGTAATTCTTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC
19AH         TTTTATCTGTAATTCTTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC
23FPO        TTTTATCTGTAATTCTTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC
19FTW        TTTTATCTGTAATTCTTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC
9VSP         TTTTATCTGTAATTCTTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC
TIGR4        TTTTATCTGTAATTCTTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC
23FTW        TTTTATCTGTAATTCTTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC
             ************************************************************
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Figure 196F

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14CSR          ATATAGATAATTTTAATTATTATAATACAAAAGAAACTAATTGTCTTGTCAAAAAGGTTG
670            ATATAGATAATTTTAATTATTATAATACAAAAGAAACTAATTGTCTTGTCAAAAAGGTTG
6BF            ATATAGATAATTTTAATTATTATAATACAAAAGAAACTAATTGTCTTGTCAAAAAGGTTG
6BSP           ATATAGATAATTTTAATTATTATAATACAAAAGAAACTAATTGTCTTGTCAAAAAGGTTG
19AH           ATATAGATAATTTTAATTATTATAATACAAAAGAAACTAATTGTCTTGTCAAAAAGGTTG
23FPO          ATATAGATAATTTTAATTATTATAATACAAAAGAAACTAATTGTCTTGTCAAAAAGGTTG
19FTW          ATATAGATAATTTTAATTATTATAATACAAAAGAAACTAATTGTCTTGTCAAAAAGGTTG
9VSP           ATATAGATAATTTTAATTATTATAATACAAAAGAAACTAATTGTCTTGTCAAAAAGGTTG
TIGR4          ATATAGATAATTTTAATTATTATAATACAAAAGAAACTAATTGTCTTGTCAAAAAGGTTG
23FTW          ATATAGATAATTTTAATTATTATAATACAAAAGAAACTAATTGTCTTGTCAAAAAGGTTG
               ************************************************************

14CSR          TGGAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
670            TGGAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
6BF            TGGAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
6BSP           TGGAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
19AH           TGGAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
23FPO          TGGAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
19FTW          TGGAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
9VSP           TGGAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
TIGR4          TGGAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
23FTW          TGGAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
               ************************************************************

14CSR          TGAGTATTGGTGGAGTTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTATCAAAT
670            TGAGTATTGGTGGAGTTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTATCAAAT
6BF            TGAGTATTGGTGGAGTTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTATCAAAT
6BSP           TGAGTATTGGTGGAGTTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTATCAAAT
19AH           TGAGTATTGGTGGAGTTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTATCAAAT
23FPO          TGAGTATTGGTGGAGTTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTATCAAAT
19FTW          TGAGTATTGGTGGAGTTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTATCAAAT
9VSP           TGAGTATTGGTGGAGTTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTT-ATCAAAT
TIGR4          TGAGTATTGGTGGAGTTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTATCAAAT
23FTW          TGAGTATTGGTGGAGTTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTATCAAAT
               **************************************************** *******

14CSR          ATTGTCGTTCTATAAAAAAATATGTGATAAAAATATCTATTGTGATGGAAGTTGTTTTAA
670            ATTGTCGTTCTATAAAAAAATATGTGATAAAAATATCTATTGTGATGGAAGTTGTTTTAA
6BF            ATTGTCGTTCTATAAAAAAATATGTGATAAAAATATCTATTGTGATGGAAGTTGTTTTAA
6BSP           ATTGTCGTTCTATAAAAAAATATGTGATAAAAATATCTATTGTGATGGAAGTTGTTTTAA
19AH           ATTGTCGTTCTATAAAAAAATATGTGATAAAAATATCTATTGTGATGGAAGTTGTTTTAA
23FPO          ATTGTCGTTCTATAAAAAAATATGTGATAAAAATATCTATTGTGATGGAAGTTGTTTTAA
19FTW          ATTGTCGTTCTATAAAAAAATATGTGATAAAAATATCTATTGTGATGGAAGTTGTTTTAA
9VSP           ATTGTCGTTCTATAAAAAAATATGTGATAAAAATATCTATTGTGATGGAAGTTGTTTTAA
TIGR4          ATTGTCGTTCTATAAAAAAATATGTGATAAAAATATCTATTGTGATGGAAGTTGTTTTAA
23FTW          ATTGTCGTTCTATAAAAAAATATGTGATAAAAATATCTATTGTGATGGAAGTTGTTTTAA
               ************************************************************

14CSR          TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
670            TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
6BF            TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
6BSP           TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
19AH           TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
23FPO          TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
19FTW          TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
9VSP           TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
TIGR4          TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
23FTW          TTTATACTAGGATAGTTAATAGTAATACTATACTA-----TATTGTATACAAGTGTGTCA
               ***********************************     ********************
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Figure 196G

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14CSR           TTGCCAGGTTGAGAAGATAGCTATAACGCACTTTTATACGCTTTTGCTACGTTTGTTAGT
670             TTGCCAGGTTGAGAAGATAGCTATAACGCACTTTTATACGCTTTTGCTACGTTTGTTAGT
6BF             TTGCCAGGTTGAGAAGATAGCTATAACGCACTTTTATACGCTTTTGCTACGTTTGTTAGT
6BSP            TTGCCAGGTTGAGAAGATAGCTATAACGCACTTTTATACGCTTTTGCTACGTTTGTTAGT
19AH            TTGCCAGGTTGAGAAGATAGCTATAACGCACTTTTATACGCTTTTGCTACGTTTGTTAGT
23FPO           TTGCCAGGTTGAGAAGATAGCTATAACGCACTTTTATACGCTTTTGCTACGTTTGTTAGT
19FTW           TTGCCAGGTTGAGAAGATAGCTATAACGCACTTTTATACGCTTTTGCTACGTTTGTTAGT
9VSP            TTGCCAGGTTGAGAAGATAGCTATAACGCACTTTTATACGCTTTTGCTACGTTTGTTAGT
TIGR4           TTGCCAGGTTGAGAAGATAGCTATAACGCACTTTTATACGCTTTTGCTACGTTTGTTAGT
23FTW           TTGCCAGGTTGAGAAGATAGCTATAACGCACTTTTATACGCTTTTGCTACGTTTGTTAGT
                ************************************************************

14CSR           GAACGGATTAACTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT
670             GAACGGATTAACTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT
6BF             GAACGGATTAACTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT
6BSP            GAACGGATTAACTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT
19AH            GAACGGATTAACTCAGCATGAGATAAATTTTATCAGAA--TAAGTAATCCGTTTCTTCGT
23FPO           GAACGGATTAACTCAGCATGAGATAAATTTTATCAGAA--TAAGTAATCCGTTTCTTCGT
19FTW           GAACGGATTAACTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT
9VSP            GAACGGATTAACTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT
TIGR4           GAACGGATTAACTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT
23FTW           GAACGGATTAACTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT
                ****************  ********************  ********************

14CSR           GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACTTGTTCTATGAATAATGC
670             GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACTTGTTCTATGAATAATGC
6BF             GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACTTGTTCTATGAATAATGC
6BSP            GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACTTGTTCTATGAATAATGC
19AH            GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACTTGTTCTATGAATAATGC
23FPO           GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACTTGTTCTATGAATAATGC
19FTW           GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACTTGTTCTATGAATAATGC
9VSP            GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACTTGTTCTATGAATAATGC
TIGR4           GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACTTGTTCTATGAATAATGC
23FTW           GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACTTGTTCTATGAATAATGC
                ************************************************************

14CSR           TTAACAGGGAGACACACATGAAAAAAGTAAGAAAGATATTTCAGAAGGCAGTTGCAGGAC
670             TTAACAGGGAGACACACATGAAAAAAGTAAGAAAGATATTTCAGAAGGCAGTTGCAGGAC
6BF             TTAACAGGGAGACACACATGAAAAAAGTAAGAAAGATATTTCAGAAGGCAGTTGCAGGAC
6BSP            TTAACAGGGAGACACACATGAAAAAAGTAAGAAAGATATTTCAGAAGGCAGTTGCAGGAC
19AH            TTAACAGGGAGACACACATGAAAAAAGTAAGAAAGATATTTCAGAAGGCAGTTGCAGGAC
23FPO           TTAACAGGGAGACACACATGAAAAAAGTAAGAAAGATATTTCAGAAGGCAGTTGCAGGAC
19FTW           TTAACAGGGAGACACACATGAAAAAAGTAAGAAAGATATTTCAGAAGGCAGTTGCAGGAC
9VSP            TTAACAGGGAGACACACATGAAAAAAGTAAGAAAGATATTTCAGAAGGCAGTTGCAGGAC
TIGR4           TTAACAGGGAGACACACATGAAAAAAGTAAGAAAGATATTTCAGAAGGCAGTTGCAGGAC
23FTW           TTAACAGGGAGACACACATGAAAAAAGTAAGAAAGATATTTCAGAAGGCAGTTGCAGGAC
                ************************************************************

14CSR           TGTGCTGTATATCTCAGTTGACAGCTTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG
670             TGTGCTGTATATCTCAGTTGACAGCTTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG
6BF             TGTGCTGTATATCTCAGTTGACAGCTTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG
6BSP            TGTGCTGTATATCTCAGTTGACAGCTTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG
19AH            TGTGCTGTATATCTCAGTTGACAGCTTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG
23FPO           TGTGCTGTATATCTCAGTTGACAGCTTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG
19FTW           TGTGCTGTATATCTCAGTTGACAGCTTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG
9VSP            TGTGCTGTATATCTCAGTTGACAGCTTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG
TIGR4           TGTGCTGTATATCTCAGTTGACAGCTTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG
23FTW           TGTGCTGTATATCTCAGTTGACAGCTTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG
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Figure 196H

PCT/US05/27239

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14CSR           AAACCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC
670             AAACCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC
6BF             AAACCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC
6BSP            AAACCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC
19AH            AAACCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC
23FPO           AAACCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC
19FTW           AAACCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC
9VSP            AAACCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC
TIGR4           AAACCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC
23FTW           AAACCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC
                ************************************************************

14CSR           TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACTGTTTCGCAAAGGA
670             TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACTGTTTCGCAAAGGA
6BF             TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACTGTTTCGCAAAGGA
6BSP            TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACTGTTTCGCAAAGGA
19AH            TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACTGTTTCGCAAAGGA
23FPO           TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACTGTTTCGCAAAGGA
19FTW           TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACTGTTTCGCAAAGGA
9VSP            TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGAATGGCACAACTGTTTCGCAAAGGA
TIGR4           TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACTGTTTCGCAAAGGA
23FTW           TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACTGTTTCGCAAAGGA
                *********************************** ************************

14CSR           CAGAGGCGCAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA
670             CAGAGGCGCAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA
6BF             CAGAGGCGCAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA
6BSP            CAGAGGCGCAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA
19AH            CAGAGGCGCAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA
23FPO           CAGAGGCGCAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA
19FTW           CAGAGGCGCAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA
9VSP            CAGAGGCGCAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA
TIGR4           CAGAGGCGCAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA
23FTW           CAGAGGCGCAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA
                ************************************************************

14CSR           CAGAAGCCCAACCTCCAGTTGGTTATAAACCCTCTACTAAACAATGGACTGTTGAAGTTG
670             CAGAAGCCCAACCTCCAGTTGGTTATAAACCCTCTACTAAACAATGGACTGTTGAAGTTG
6BF             CAGAAGCCCAACCTCCAGTTGGTTATAAACCCTCTACTAAACAATGGACTGTTGAAGTTG
6BSP            CAGAAGCCCAACCTCCAGTTGGTTATAAACCCTCTACTAAACAATGGACTGTTGAAGTTG
19AH            CAGAAGCCCAACCTCCAGTTGGTTATAAACCCTCTACTAAACAATGGACTGTTGAAGTTG
23FPO           CAGAAGCCCAACCTCCAGTTGGTTATAAACCCTCTACTAAACAATGGACTGTTGAAGTTG
19FTW           CAGAAGCCCAACCTCCAGTTGGTTATAAACCCTCTACTAAACAATGGACTGTTGAAGTTG
9VSP            CAGAAGCCCAACCTCCAGTTGGTTATAAACCCTCTACTAAACAACGGACTGTTGAAGTTG
TIGR4           CAGAAGCCCAACCTCCAGTTGGTTATAAACCCTCTACTAAACAATGGACTGTTGAAGTTG
23FTW           CAGAAGCCCAACCTCCAGTTGGTTATAAACCCTCTACTAAACAATGGACTGTTGAAGTTG
                ******************************************** ***************

14CSR           AGAAGAATGGTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT
670             AGAAGAATGGTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT
6BF             AGAAGAATGGTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT
6BSP            AGAAGAATGGTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT
19AH            AGAAGAATGGTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT
23FPO           AGAAGAATGGTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT
19FTW           AGAAGAATGGTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT
9VSP            AGAAGAATGGTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT
TIGR4           AGAAGAATGGTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT
23FTW           AGAAGAATGGTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT
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Figure 196I

402/487

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14CSR           CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
670             CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
6BF             CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
6BSP            CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
19AH            CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
23FPO           CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
19FTW           CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
9VSP            CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
TIGR4           CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
23FTW           CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
                ************************************************************

14CSR           AGGTAGATGGTTCGGAAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
670             AGGTAGATGGTTCGGAAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
6BF             AGGTAGATGGTTCGGAAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
6BSP            AGGTAGATGGTTCGGAAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
19AH            AGGTAGATGGTTCGGAAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
23FPO           AGGTAGATGGTTCGGAAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
19FTW           AGGTAGATGGTTCGGAAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
9VSP            AGGTAGATGGTTCGGAAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
TIGR4           AGGTAGATGGTTCGGAAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
23FTW           AGGTAGATGGTTCGGAAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
                ************************************************************

14CSR           GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
670             GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
6BF             GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
6BSP            GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
19AH            GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
23FPO           GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
19FTW           GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
9VSP            GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
TIGR4           GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
23FTW           GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
                ************************************************************

14CSR           ACCAATATGGAATCGAGTTGACGGTTAGTGGTAAAACGACGGTTGAAACGAAAGAAGCCT
670             ACCAATATGGAATCGAGTTGACGGTTAGTGGTAAAACGACGGTTGAAACGAAAGAAGCCT
6BF             ACCAATATGGAATCGAGTTGACGGTTAGTGGTAAAACGACGGTTGAAACGAAAGAAGCCT
6BSP            ACCAATATGGAATCGAGTTGACGGTTAGTGGTAAAACGACGGTTGAAACGAAAGAAGCCT
19AH            ACCAATATGGAATCGAGTTGACGGTTAGTGGTAAAACGACGGTTGAAACGAAAGAAGCCT
23FPO           ACCAATATGGAATCGAGTTGACGGTTAGTGGTAAAACGACGGTTGAAACGAAAGAAGCCT
19FTW           ACCAATATGGAATCGAATTGACGGTTAGTGGGAAAACAGTGTATGAACGAAAAGATAAGT
9VSP            ACCAATATGGAATCGAATTGACGGTTAGTGGGAAAACAGTGTATGAACGAAAAGATAAGT
TIGR4           ACCAATATGGAATCGAATTGACGGTTAGTGGGAAAACAGTGTATGAACAAAAAGATAAGT
23FTW           ACCAATATGGAATCGAATTGACGGTTAGTGGGAAAACAGTGTATGAACAAAAAGATAAGT
                **************** ************** *****   *  ****   *****    *

14CSR           CTACTCCGCTAGATGTTGTTATTCTATTAGATAACTCCAATAGTATGAGTAATATTCGAC
670             CTACTCCGCTAGATGTTGTTATTCTATTAGATAACTCCAATAGTATGAGTAATATTCGAC
6BF             CTACTCCGCTAGATGTTGTTATTCTATTAGATAACTCCAATAGTATGAGTAATATTCGAC
6BSP            CTACTCCGCTAGATGTTGTTATTCTATTAGATAACTCCAATAGTATGAGTAATATTCGAC
19AH            CTACTCCGCTAGATGTTGTTATTCTATTAGATAACTCCAATAGTATGAGTAATATTCGAC
23FPO           CTACTCCGCTAGATGTTGTTATTCTATTAGATAACTCCAATAGTATGAGTAATATTCGAC
19FTW           CTGTGCCGCTGGATGTCGTTATCTTGCTCGATAACTCAAATAGTATGAGTAACATTCGAA
9VSP            CTGTGCCGCTGGATGTCGTTATCTTGCTCGATAACTCAAATAGTATGAGTAACATTCGAA
TIGR4           CTGTGCCGCTGGATGTCGTTATCTTGCTCGATAACTCAAATAGTATGAGTAACATTCGAA
23FTW           CTGTGCCGCTGGATGTCGTTATCTTGCTCGATAACTCAAATAGTATGAGTAACATTCGAA
                **   ***** ***** *****  *  * ******** ************** ******
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Figure 196J

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14CSR               ATAATCATGCCCATCGAGCGGAAAAAGCGGGAGAAGCGACACGAGCCCTTGTAGATAAGA
670                 ATAATCATGCCCATCGAGCGGAAAAAGCGGGAGAAGCGACACGAGCCCTTGTAGATAAGA
6BF                 ATAATCATGCCCATCGAGCGGAAAAAGCGGGAGAAGCGACACGAGCCCTTGTAGATAAGA
6BSP                ATAATCATGCCCATCGAGCGGAAAAAGCGGGAGAAGCGACACGAGCCCTTGTAGATAAGA
19AH                ATAATCATGCCCATCGAGCGGAAAAAGCGGGAGAAGCGACACGAGCCCTTGTAGATAAGA
23FPO               ATAATCATGCCCATCGAGCGGAAAAAGCGGGAGAAGCGACACGAGCCCTTGTAGATAAGA
19FTW               ACAAGAATGCTCGACGTGCGGAAAGAGCTGGTGAGGCGACACGTTCTCTTATTGATAAAA
9VSP                ACAAGAATGCTCGACGTGCGGAAAGAGCTGGTGAGGCGACACGTTCTCTTATTGATAAAA
TIGR4               ACAAGAATGCTCGACGTGCGGAAAGAGCTGGTGAGGCGACACGTTCTCTTATTGATAAAA
23FTW               ACAAGAATGCTCGACGTGCGGAAAGAGCTGGTGAGGCGACACGTTCTCTTATTGATAAAA
                    * **  **** *  ** ******* *** ** ** ********  * *** * ***** *

14CSR               TTACCTCCAATCCAGATAATCGAGTAGCACTTGTGACTTATGGCTCAACTATCTTTGACG
670                 TTACCTCCAATCCAGATAATCGAGTAGCACTTGTGACTTATGGCTCAACTATCTTTGACG
6BF                 TTACCTCCAATCCAGATAATCGAGTAGCACTTGTGACTTATGGCTCAACTATCTTTGACG
6BSP                TTACCTCCAATCCAGATAATCGAGTAGCACTTGTGACTTATGGCTCAACTATCTTTGACG
19AH                TTACCTCCAATCCAGATAATCGAGTAGCACTTGTGACTTATGGCTCAACTATCTTTGACG
23FPO               TTACCTCCAATCCAGATAATCGAGTAGCACTTGTGACTTATGGCTCAACTATCTTTGACG
19FTW               TTACATCTGATCCAGAAAATAGGGTAGCGCTTGTGACTTATGCTTCCACTATCTTTGATG
9VSP                TTACATCTGATCCAGAAAATAGGGTAGCGCTTGTGACTTATGCTTCCACTATCTTTGATG
TIGR4               TTACATCTGATTCAGAAAATAGGGTAGCGCTTGTGACTTATGCTTCCACTATCTTTGATG
23FTW               TTACATCTGATCCAGAAAATAGGGTAGCGCTTGTGACTTATGCTTCCACTATCTTTGATG
                    **** **  ** **** *** * ***** *************  ** *********** *

14CSR               GTTCAGAAGCTACTGTGGAAAAAGGGGTAGCAGATGCGAACGGAAAAATATTGAATGACT
670                 GTTCAGAAGCTACTGTGGAAAAAGGGGTAGCAGATGCGAACGGAAAAATATTGAATGACT
6BF                 GTTCAGAAGCTACTGTGGAAAAAGGGGTAGCAGATGCGAACGGAAAAATATTGAATGACT
6BSP                GTTCAGAAGCTACTGTGGAAAAAGGGGTAGCAGATGCGAACGGAAAAATATTGAATGACT
19AH                GTTCAGAAGCTACTGTGGAAAAAGGGGTAGCAGATGCGAACGGAAAAATATTGAATGACT
23FPO               GTTCAGAAGCTACTGTGGAAAAAGGGGTAGCAGATGCGAACGGAAAAATATTGAATGACT
19FTW               GGACCGAGTTTACAGTAGAAAAAGGGGTAGCAGATAAAAACGGAAAACGATTGAATGATT
9VSP                GGACCGAGTTTACAGTAGAAAAAGGGGTAGCAGATAAAAACGGAAAACGATTGAATGATT
TIGR4               GGACCGAGTTTACAGTAGAAAAAGGGGTAGCAGATAAAAACGGAAAGCGATTGAATGATT
23FTW               GGACCGAGTTTACAGTAGAAAAAGGGGTAGCAGATAAAAACGGAAAACGATTGAATGATT
                    *  * **   *** ** ******************   ********   ********* *

14CSR               CAGCTTTATGGACGTTCGATCGTACGACGTTTACAGCTAAAACTTATAATTATAGCTTTT
670                 CAGCTTTATGGACGTTCGATCGTACGACGTTTACAGCTAAAACTTATAATTATAGCTTTT
6BF                 CAGCTTTATGGACGTTCGATCGTACGACGTTTACAGCTAAAACTTATAATTATAGCTTTT
6BSP                CAGCTTTATGGACGTTCGATCGTACGACGTTTACAGCTAAAACTTATAATTATAGCTTTT
19AH                CAGCTTTATGGACGTTCGATCGTACGACGTTTACAGCTAAAACTTATAATTATAGCTTTT
23FPO               CAGCTTTATGGACGTTCGATCGTACGACGTTTACAGCTAAAACTTATAATTATAGCTTTT
19FTW               CTCTTTTTTGGAATTATGATCAGACGAGTTTTACAACCAATACCAAAGATTATAGTTATT
9VSP                CTCTTTTTTGGAATTATGATCAGACGAGTTTTACAACCAATACCAAAGATTATAGTTATT
TIGR4               CTCTTTTTTGGAATTATGATCAGACGAGTTTTACAACCAATACCAAAGATTATAGTTATT
23FTW               CTCTTTTTTGGAATTATGATCAGACGAGTTTTACAACCAATACCAAAGATTATAGTTATT
                    *   *** ****  *  ****  ****  ****** * ** **  *  ******* * **

14CSR               TAAATCTCACATCAGATCCTACTGATATTCAAACTATTAAGGATAGGATTCCATCAGATG
670                 TAAATCTCACATCAGATCCTACTGATATTCAAACTATTAAGGATAGGATTCCATCAGATG
6BF                 TAAATCTCACATCAGATCCTACTGATATTCAAACTATTAAGGATAGGATTCCATCAGATG
6BSP                TAAATCTCACATCAGATCCTACTGATATTCAAACTATTAAGGATAGGATTCCATCAGATG
19AH                TAAATCTCACATCAGATCCTACTGATATTCAAACTATTAAGGATAGGATTCCATCAGATG
23FPO               TAAATCTCACATCAGATCCTACTGATATTCAAACTATTAAGGATAGGATTCCATCAGATG
19FTW               TAAAGCTGACTAATGATAAGAATGACATTGTAGAATTAAAAAATAAGGTACCTACCGAGG
9VSP                TAAAGCTGACTAATGATAAGAATGACATTGTAGAATTAAAAAATAAGGTACCTACCGAGG
TIGR4               TAAAGCTGACTAATGATAAGAATGACATTGTAGAATTAAAAAATAAGGTACCTACCGAGG
23FTW               TAAAGCTGACTAATGATAAGAATGACATTGTAGAATTAAAAAATAAGGTACCTACCGAGG
                    **** ** **    ***   * *** ***  *    * **  *** * * **  * ** *
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Figure 196K

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14CSR           CAGAGGAATTGAACAAAGACAAATTGATGTATCAATTCGGCGCGACTTTTACCCAGAAGG
670             CAGAGGAATTGAACAAAGACAAATTGATGTATCAATTCGGCGCGACTTTTACCCAGAAGG
6BF             CAGAGGAATTGAACAAAGACAAATTGATGTATCAATTCGGCGCGACTTTTACCCAGAAGG
6BSP            CAGAGGAATTGAACAAAGACAAATTGATGTATCAATTCGGCGCGACTTTTACCCAGAAGG
19AH            CAGAGGAATTGAACAAAGACAAATTGATGTATCAATTCGGCGCGACTTTTACCCAGAAGG
23FPO           CAGAGGAATTGAACAAAGACAAATTGATGTATCAATTCGGCGCGACTTTTACCCAGAAGG
19FTW           CAGAAGATCATGATGGAAATAGATTGATGTACCAATTCGGTGCCACTTTTACTCAGAAAG
9VSP            CAGAAGACCATGATGGAAATAGATTGATGTACCAATTCGGTGCCACTTTTACTCAGAAAG
TIGR4           CAGAAGACCATGATGGAAATAGATTGATGTACCAATTCGGTGCCACTTTTACTCAGAAAG
23FTW           CAGAAGACCATGATGGAAATAGATTGATGTACCAATTCGGTGCCACTTTTACTCAGAAAG
                **** **     *   * * * ********* ******** ** ******** ***** *

14CSR           CTTTGATGACCGCTGATGATATCTTGACAAAGCAGGCAAGACCAAACAGTAAAAAGGTTA
670             CTTTGATGACCGCTGATGATATCTTGACAAAGCAGGCAAGACCAAACAGTAAAAAGGTTA
6BF             CTTTGATGACCGCTGATGATATCTTGACAAAGCAGGCAAGACCAAACAGTAAAAAGGTTA
6BSP            CTTTGATGACCGCTGATGATATCTTGACAAAGCAGGCAAGACCAAACAGTAAAAAGGTTA
19AH            CTTTGATGACCGCTGATGATATCTTGACAAAGCAGGCAAGACCAAACAGTAAAAAGGTTA
23FPO           CTTTGATGACCGCTGATGATATCTTGACAAAGCAGGCAAGACCAAACAGTAAAAAGGTTA
19FTW           CTTTGATGAAGGCAGATGAGATTTTGACACAACAAGCGAGACAAAATAGTCAAAAAGTCA
9VSP            CTTTGATGAAGGCCGATGAGATTTTGACACAACAAGCGAGACAAAATAGTCAAAAAGTCA
TIGR4           CTTTGATGAAGGCAGATGAGATTTTGACACAACAAGCGAGACAAAATAGTCAAAAAGTCA
23FTW           CTTTGATGAAGGCAGATGAGATTTTGACACAACAAGCGAGACAAAATAGTCAAAAAGTCA
                *********  ** ***** ** ****** * ** ** **** *** *** **** ** *

14CSR           TTTTCCACATTACAGATGGTGTTCCGACTATGTCATATCCAATTAATTTTAAATATACAG
670             TTTTCCACATTACAGATGGTGTTCCGACTATGTCATATCCAATTAATTTTAAATATACAG
6BF             TTTTCCACATTACAGATGGTGTTCCGACTATGTCATATCCAATTAATTTTAAATATACAG
6BSP            TTTTCCACATTACAGATGGTGTTCCGACTATGTCATATCCAATTAATTTTAAATATACAG
19AH            TTTTCCACATTACAGATGGTGTTCCGACTATGTCATATCCAATTAATTTTAAATATACAG
23FPO           TTTTCCACATTACAGATGGTGTTCCGACTATGTCATATCCAATTAATTTTAAATATACAG
19FTW           TTTTCCATATTACGGATGGTGTCCCAACTATGTCGTATCCGATTAATTTTAATCATGCTA
9VSP            TTTTCCATATTACGGATGGTGTCCCAACTATGTCGTATCCGATTAATTTTAATCATGCTA
TIGR4           TTTTCCATATTACGGATGGTGTCCCAACTATGTCGTATCCGATTAATTTTAATCATGCTA
23FTW           TTTTCCATATTACGGATGGTGTCCCAACTATGTCGTATCCGATTAATTTTAATCATGCTA
                ******* ***** ******** ** ******** ***** ***********  ** *

14CSR           GAACGACGCAATCGTACAGAACTCAGCTGAATA-ATTTTAAAGCAAAAACTCCAAATAGT
670             GAACGACGCAATCGTACAGAACTCAGCTGAATA-ATTTTAAAGCAAAAACTCCAAATAGT
6BF             GAACGACGCAATCGTACAGAACTCAGCTGAATA-ATTTTAAAGCAAAAACTCCAAATAGT
6BSP            GAACGACGCAATCGTACAGAACTCAGCTGAATA-ATTTTAAAGCAAAAACTCCAAATAGT
19AH            GAACGACGCAATCGTACAGAACTCAGCTGAATA-ATTTTAAAGCAAAAACTCCAAATAGT
23FPO           GAACGACGCAATCGTACAGAACTCAGCTGAATA-ATTTTAAAGCAAAAACTCCAAATAGT
19FTW           CGTTTGCTCCATCATATCAAAATCAACTAAATGCATTTTTTAGTAAAT-CTCCTAATAAA
9VSP            CGTTTGCTCCATCATATCAAAATCAACTAAATGTATTTTTTAGTAAAT-CTCCTAATAAA
TIGR4           CGTTTGCTCCATCATATCAAAATCAACTAAATGCATTTTTTAGTAAAT-CTCCTAATAAA
23FTW           CGTTTGCTCCATCATATCAAAATCAACTAAATGCATTTTTTAGTAAAT-CTCCTAATAAA
                      * * *** **   ** *** ** ***  *****  ** ***  **** ****

14CSR           AGCGGGATATTACTGGAGGACTTTGTTACATGGTCAGCAGATGGTGAACATAAGATTGTT
670             AGCGGGATATTACTGGAGGACTTTGTTACATGGTCAGCAGATGGTGAACATAAGATTGTT
6BF             AGCGGGATATTACTGGAGGACTTTGTTACATGGTCAGCAGATGGTGAACATAAGATTGTT
6BSP            AGCGGGATATTACTGGAGGACTTTGTTACATGGTCAGCAGATGGTGAACATAAGATTGTT
19AH            AGCGGGATATTACTGGAGGACTTTGTTACATGGTCAGCAGATGGTGAACATAAGATTGTT
23FPO           AGCGGGATATTACTGGAGGACTTTGTTACATGGTCAGCAGATGGTGAACATAAGATTGTT
19FTW           GATGGAATACTATTAAGTGATTTTATTACGCAAGCAACTAGTGGAGAACATACAATTGTA
9VSP            GATGGAATACTATTAAGTGATTTTATTACGCAAGCAACTAGTGGAGAACATACAATTGTA
TIGR4           GATGGAATACTATTAAGTGATTTTATTACGCAAGCAACTAGTGGAGAACATACAATTGTA
23FTW           GATGGAATACTATTAAGTGATTTTATTACGCAAGCAACTAGTGGAGAACATACAATTGTA
                   ** *** ** *    ** *** ****     ** *   *** *******  *****
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Figure 196L

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14CSR           CGTGGAGATGGTGAAAGTTATCAGATGTTTACGAAGAAACCTGT------AACAGACCAA
670             CGTGGAGATGGTGAAAGTTATCAGATGTTTACGAAGAAACCTGT------AACAGACCAA
6BF             CGTGGAGATGGTGAAAGTTATCAGATGTTTACGAAGAAACCTGT------AACAGACCAA
6BSP            CGTGGAGATGGTGAAAGTTATCAGATGTTTACGAAGAAACCTGT------AACAGACCAA
19AH            CGTGGAGATGGTGAAAGTTATCAGATGTTTACGAAGAAACCTGT------AACAGACCAA
23FPO           CGTGGAGATGGTGAAAGTTATCAGATGTTTACGAAGAAACCTGT------AACAGACCAA
19FTW           CGCGGAGATGGGCAAAGTTACCAGATGTTTACAGATAAGACAGTTTATGAAAAAGGTGCT
9VSP            CGCGGAGATGGGCAAAGTTACCAGATGTTTACAGATAAGACAGTTTATGAAAAAGGTGCT
TIGR4           CGCGGAGATGGGCAAAGTTACCAGATGTTTACAGATAAGACAGTTTATGAAAAAGGTGCT
23FTW           CGCGGAGATGGGCAAAGTTACCAGATGTTTACAGATAAGACAGTTTATGAAAAAGGTGCT
                ** ********  ******* ***********  * **  * **      ** **

14CSR           TACGGAGTTCATCAAAT---ACTTTCAATCACCTCCATGGAGCAGAGAGCTAAATTAGTT
670             TACGGAGTTCATCAAAT---ACTTTCAATCACCTCCATGGAGCAGAGAGCTAAATTAGTT
6BF             TACGGAGTTCATCAAAT---ACTTTCAATCACCTCCATGGAGCAGAGAGCTAAATTAGTT
6BSP            TACGGAGTTCATCAAAT---ACTTTCAATCACCTCCATGGAGCAGAGAGCTAAATTAGTT
19AH            TACGGAGTTCATCAAAT---ACTTTCAATCACCTCCATGGAGCAGAGAGCTAAATTAGTT
23FPO           TACGGAGTTCATCAAAT---ACTTTCAATCACCTCCATGGAGCAGAGAGCTAAATTAGTT
19FTW           CCTGCAGCTTTCCCAGTTAAACCTGAAAAATATTCTGAAATGAAGGCGGTTGGTTATGCA
9VSP            CCTGCAGCTTTCCCAGTTAAACCTGAAAAATATTCTGAAATGAAGGCGGTTGGTTATGCA
TIGR4           CCTGCAGCTTTCCCAGTTAAACCTGAAAAATATTCTGAAATGAAGGCGGCTGGTTATGCA
23FTW           CCTGCAGCTTTCCCAGTTAAACCTGAAAAATATTCTGAAATGAAGGCGGCTGGTTATGCA
                   * ** *   * * *   ** *  **     **      * **   * *   *  *

14CSR           TCAGCGGGATATAGGTTCTATGGAACTGACTTGTATTTATATTGGCGTGATAGTATTCTA
670             TCAGCGGGATATAGGTTCTATGGAACTGACTTGTATTTATATTGGCGTGATAGTATTCTA
6BF             TCAGCGGGATATAGGTTCTATGGAACTGACTTGTATTTATATTGGCGTGATAGTATTCTA
6BSP            TCAGCGGGATATAGGTTCTATGGAACTGACTTGTATTTATATTGGCGTGATAGTATTCTA
19AH            TCAGCGGGATATAGGTTCTATGGAACTGACTTGTATTTATATTGGCGTGATAGTATTCTA
23FPO           TCAGCGGGATATAGGTTCTATGGAACTGACTTGTATTTATATTGGCGTGATAGTATTCTA
19FTW           GTTATAGGCGATCCAATTAATGGTGGATATATTTGGCTTAATTGGAGAGAGAGTATTCTG
9VSP            GTTATAGGCGATCCAATTAATGGTGGATATATTTGGCTTAATTGGAGAGAGAGTATTCTG
TIGR4           GTTATAGGCGATCCAATTAATGGTGGATATATTTGGCTTAATTGGAGAGAGAGTATTCTG
23FTW           GTTATAGGCGATCCAATTAATGGTGGATATATTTGGCTTAATTGGAGAGAGAGTATTCTG
                      **  **    *  ****     *  * *   *  ***** * ** ********

14CSR           GCCTATCCATTTAACTCTAGTACCGATTGGATTACCAACCATGGTGACCCTACGACTTGG
670             GCCTATCCATTTAACTCTAGTACCGATTGGATTACCAACCATGGTGACCCTACGACTTGG
6BF             GCCTATCCATTTAACTCTAGTACCGATTGGATTACCAACCATGGTGACCCTACGACTTGG
6BSP            GCCTATCCATTTAACTCTAGTACCGATTGGATTACCAACCATGGTGACCCTACGACTTGG
19AH            GCCTATCCATTTAACTCTAGTACCGATTGGATTACCAACCATGGTGACCCTACGACTTGG
23FPO           GCCTATCCATTTAACTCTAGTACCGATTGGATTACCAACCATGGTGACCCTACGACTTGG
19FTW           GCTTATCCGTTTAATTCTAATACTGCTAAAATTACCAATCATGGTGCCCCTACAAGATGG
9VSP            GCTTATCCGTTTAATTCTAATACTGCTAAAATTACCAATCATGGTGACCCTACAAGATGG
TIGR4           GCTTATCCGTTTAATTCTAATACTGCTAAAATTACCAATCATGGTGACCCTACAAGATGG
23FTW           GCTTATCCGTTTAATTCTAATACTGCTAAAATTACCAATCATGGTGACCCTACAAGATGG
                ** ***** ***** **** *** * *   ******** ******* ****** *  ***

14CSR           TATTATAACGGAAATATGGCTCAGGATGGCTATGATGTCTTCACTGTTGGGGTTGGTGTA
670             TATTATAACGGAAATATGGCTCAGGATGGCTATGATGTCTTCACTGTTGGGGTTGGTGTA
6BF             TATTATAACGGAAATATGGCTCAGGATGGCTATGATGTCTTCACTGTTGGGGTTGGTGTA
6BSP            TATTATAACGGAAATATGGCTCAGGATGGCTATGATGTCTTCACTGTTGGGGTTGGTGTA
19AH            TATTATAACGGAAATATGGCTCAGGATGGCTATGATGTCTTCACTGTTGGGGTTGGTGTA
23FPO           TATTATAACGGAAATATGGCTCAGGATGGCTATGATGTCTTCACTGTTGGGGTTGGTGTA
19FTW           TACTATAACGGGAATATTGCTCCTGATGGGTATGATGTCTTTACGGTAGGTATTGGTATT
9VSP            TACTATAACGGGAATATTGCTCCTGATGGGTATGATGTCTTTACGGTAGGTATTGGTATT
TIGR4           TACTATAACGGGAATATTGCTCCTGATGGGTATGATGTCTTTACGGTAGGTATTGGTATT
23FTW           TACTATAACGGGAATATTGCTCCTGATGGGTATGATGTCTTTACGGTAGGTATTGGTATT
                ** ******** ***** ****  ***** *********** ** ** **  ***** *
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Figure 196M

```
14CSR           AACGGGGATCCTGGTACGGATGAAGCAACGGCTACTAGATTTATGCAGAGCATCTCTAGT
670             AACGGGGATCCTGGTACGGATGAAGCAACGGCTACTAGATTTATGCAGAGCATCTCTAGT
6BF             AACGGGGATCCTGGTACGGATGAAGCAACGGCTACTAGATTTATGCAGAGCATCTCTAGT
6BSP            AACGGGGATCCTGGTACGGATGAAGCAACGGCTACTAGATTTATGCAGAGCATCTCTAGT
19AH            AACGGGGATCCTGGTACGGATGAAGCAACGGCTACTAGATTTATGCAGAGCATCTCTAGT
23FPO           AACGGGGATCCTGGTACGGATGAAGCAACGGCTACTAGATTTATGCAGAGCATCTCTAGT
19FTW           AACGGAGATCCTGGTACGGATGAAGCAACGGCTACTAGTTTTATGCAAAGTATTTCTAGT
9VSP            AACGGAGATCCTGGTACGGATGAAGCAACGGCTACTAGTTTTATGCAAAGTATTTCTAGT
TIGR4           AACGGAGATCCTGGTACGGATGAAGCAACGGCTACTAGTTTTATGCAAAGTATTTCTAGT
23FTW           AACGGAGATCCTGGTACGGATGAAGCAACGGCTACTAGTTTTATGCAAAGTATTTCTAGT
                ***** ******************************** ******** ** ** ******

14CSR           TCTCCTGACAACTACACTAACGTAGCAGATCCATCTCAGATTTTACAAGAATTGAATCGC
670             TCTCCTGACAACTACACTAACGTAGCAGATCCATCTCAGATTTTACAAGAATTGAATCGC
6BF             TCTCCTGACAACTACACTAACGTAGCAGATCCATCTCAGATTTTACAAGAATTGAATCGC
6BSP            TCTCCTGACAACTACACTAACGTAGCAGATCCATCTCAGATTTTACAAGAATTGAATCGC
19AH            TCTCCTGACAACTACACTAACGTAGCAGATCCATCTCAGATTTTACAAGAATTGAATCGC
23FPO           TCTCCTGACAACTACACTAACGTAGCAGATCCATCTCAGATTTTACAAGAATTGAATCGC
19FTW           AAACCTGAAAACTATACCAATGTTACTGACACGACAAAAATATTGGAACAGTTGAATCGT
9VSP            AAACCTGAAAACTATACCAATGTTACTGACACGACAAAAATATTGGAACAGTTGAATCGT
TIGR4           AAACCTGAAAACTATACCAATGTTACTGACACGACAAAAATATTGGAACAGTTGAATCGT
23FTW           AAACCTGAAAACTATACCAATGTTACTGACACGACAAAAATATTGGAACAGTTGAATCGT
                   ***** ***** ** ** **  * **  *  *  * ** **  ** * ******** 

14CSR           TACTTCTATACTATCGTCAATGAGAAGAAATCTATCGAAAATGGTACGATTACAGACCCG
670             TACTTCTATACTATCGTCAATGAGAAGAAATCTATCGAAAATGGTACGATTACAGACCCG
6BF             TACTTCTATACTATCGTCAATGAGAAGAAATCTATCGAAAATGGTACGATTACAGACCCG
6BSP            TACTTCTATACTATCGTCAATGAGAAGAAATCTATCGAAAATGGTACGATTACAGACCCG
19AH            TACTTCTATACTATCGTCAATGAGAAGAAATCTATCGAAAATGGTACGATTACAGACCCG
23FPO           TACTTCTATACTATCGTCAATGAGAAGAAATCTATCGAAAATGGTACGATTACAGACCCG
19FTW           TATTTCCACACCATCGTAACTGAAAAGAAATCAATTGAGAATGGTACGATTACAGATCCG
9VSP            TATTTCCACACCATCGTAACTGAAAAGAAATCAATTGAGAATGGTACGATTACAGATCCG
TIGR4           TATTTCCACACCATCGTAACTGAAAAGAAATCAATTGAGAATGGTACGATTACAGATCCG
23FTW           TATTTCCACACCATCGTAACTGAAAAGAAATCAATTGAGAATGGTACGATTACAGATCCG
                ** *** * ** ***** * *** ******** ** ** ***************** ***

14CSR           ATGGGTGAACTAATTGATTTCCAATTGGGAGCAGATGGAAGGTTTGATCCAGCGGATTAC
670             ATGGGTGAACTAATTGATTTCCAATTGGGAGCAGATGGAAGGTTTGATCCAGCGGATTAC
6BF             ATGGGTGAACTAATTGATTTCCAATTGGGAGCAGATGGAAGGTTTGATCCAGCGGATTAC
6BSP            ATGGGTGAACTAATTGATTTCCAATTGGGAGCAGATGGAAGGTTTGATCCAGCGGATTAC
19AH            ATGGGTGAACTAATTGATTTCCAATTGGGAGCAGATGGAAGGTTTGATCCAGCGGATTAC
23FPO           ATGGGTGAACTAATTGATTTCCAATTGGGAGCAGATGGAAGGTTTGATCCAGCGGATTAC
19FTW           ATGGGTGAGTTAATTGATTTGCAATTGGGCACAGATGGAAGATTTGATCCAGCAGATTAC
9VSP            ATGGGTGAGTTAATTGATTTGCAATTGGGCACAGATGGAAGATTTGATCCAGCAGATTAC
TIGR4           ATGGGTGAGTTAATTGATTTGCAATTGGGCACAGATGGAAGATTTGATCCAGCAGATTAC
23FTW           ATGGGTGAGTTAATTGATTTGCAATTGGGCACAGATGGAAGATTTGATCCAGCAGATTAC
                ********  ********** ********  ********** *********** ******

14CSR           ACTTTAACTGCAAACGATGGTAGTTCGTTGGTGAATAATGTCCCTACTGGGGGACCACAA
670             ACTTTAACTGCAAACGATGGTAGTTCGTTGGTGAATAATGTCCCTACTGGGGGACCACAA
6BF             ACTTTAACTGCAAACGATGGTAGTTCGTTGGTGAATAATGTCCCTACTGGGGGACCACAA
6BSP            ACTTTAACTGCAAACGATGGTAGTTCGTTGGTGAATAATGTCCCTACTGGGGGACCACAA
19AH            ACTTTAACTGCAAACGATGGTAGTTCGTTGGTGAATAATGTCCCTACTGGGGGACCACAA
23FPO           ACTTTAACTGCAAACGATGGTAGTTCGTTGGTGAATAATGTCCCTACTGGGGGACCACAA
19FTW           ACTTTAACTGCAAACGATGGTAGTCGCTTGGAGAATGGACAAGCTGTAGGTGGTCCACAA
9VSP            ACTTTAACTGCAAACGATGGTAGTCGCTTGGAGAATGGACAAGCTGTAGGTGGTCCACAA
TIGR4           ACTTTAACTGCAAACGATGGTAGTCGCTTGGAGAATGGACAAGCTGTAGGTGGTCCACAA
23FTW           ACTTTAACTGCAAACGATGGTAGTCGCTTGGAGAATGGACAAGCTGTAGGTGGTCCACAA
                ************************   **** ****       **   **  ** ** ******
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Figure 196N

```
14CSR          AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT
670            AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT
6BF            AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT
6BSP           AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT
19AH           AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT
23FPO          AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT
19FTW          AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT
9VSP           AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT
TIGR4          AATGATGGTGGTTTGTTAAAAAATGCAAAAGTGCTCTATGATACGACTGAGAAAAGGATT
23FTW          AATGATGGTGGTTTGTTAAAAAATGCAAAAGTGCTCTATGATACGACTGAGAAAAGGATT
               *********** *** ***************** **************************

14CSR          CGTGTAACAGGTTTGTACCTTGGAACGGGTGAAAAAGTTACATTGACTTATAATGTTCGC
670            CGTGTAACAGGTTTGTACCTTGGAACGGGTGAAAAAGTTACATTGACTTATAATGTTCGC
6BF            CGTGTAACAGGTTTGTACCTTGGAACGGGTGAAAAAGTTACATTGACTTATAATGTTCGC
6BSP           CGTGTAACAGGTTTGTACCTTGGAACGGGTGAAAAAGTTACATTGACTTATAATGTTCGC
19AH           CGTGTAACAGGTTTGTACCTTGGAACGGGTGAAAAAGTTACATTGACTTATAATGTTCGC
23FPO          CGTGTAACAGGTTTGTACCTTGGAACGGGTGAAAAAGTTACATTGACTTATAATGTTCGC
19FTW          CGTGTAACAGGTTTGTACCTTGGAACGGGTGAAAAAGTTACATTGACTTATAATGTTCGC
9VSP           CGTGTAACAGGTTTGTACCTTGGAACGGGTGAAAAAGTTACATTGACTTATAATGTTCGC
TIGR4          CGTGTAACAGGTCTGTACCTTGGAACGGATGAAAAAGTTACGTTGACCTACAATGTTCGT
23FTW          CGTGTAACAGGTCTGTACCTTGGAACGGATGAAAAAGTTACGTTGACCTACAATGTTCGT
               ************ *************** ************ ***** ** ******** 

14CSR          TTGAATGACCAATTTGTAAGCAATAAATTCTATGACACGAATGGTCGAACAACCCTACAC
670            TTGAATGACCAATTTGTAAGCAATAAATTCTATGACACGAATGGTCGAACAACCCTACAC
6BF            TTGAATGACCAATTTGTAAGCAATAAATTCTATGACACGAATGGTCGAACAACCCTACAC
6BSP           TTGAATGACCAATTTGTAAGCAATAAATTCTATGACACGAATGGTCGAACAACCCTACAC
19AH           TTGAATGACCAATTTGTAAGCAATAAATTCTATGACACGAATGGTCGAACAACCCTACAC
23FPO          TTGAATGACCAATTTGTAAGCAATAAATTCTATGACACGAATGGTCGAACAACCCTACAC
19FTW          TTGAATGACCAATTTGTAAGCAATAAATTCTATGACACGAATGGTCGAACAACCCTACAC
9VSP           TTGAATGACCAATTTGTAAGCAATAAATTCTATGACACGAATGGTCGAACAACCCTACAC
TIGR4          TTGAATGATGAGTTTGTAAGCAATAAATTTTATGATACCAATGGTCGAACAACCTTACAT
23FTW          TTGAATGATGAGTTTGTAAGCAATAAATTTTATGATACCAATGGTCGAACAACCTTACAT
               ********  * ***************** ***** ** *************** **** 

14CSR          CCTAAGGAAGTAGAAAAGAACACAGTGCGCGACTTCCCGATTCCTAAGATTCGTGATGTA
670            CCTAAGGAAGTAGAAAAGAACACAGTGCGCGACTTCCCGATTCCTAAGATTCGTGATGTA
6BF            CCTAAGGAAGTAGAAAAGAACACAGTGCGCGACTTCCCGATTCCTAAGATTCGTGATGTA
6BSP           CCTAAGGAAGTAGAAAAGAACACAGTGCGCGACTTCCCGATTCCTAAGATTCGTGATGTA
19AH           CCTAAGGAAGTAGAAAAGAACACAGTGCGCGACTTCCCGATTCCTAAGATTCGTGATGTA
23FPO          CCTAAGGAAGTAGAAAAGAACACAGTGCGCGACTTCCCGATTCCTAAGATTCGTGATGTA
19FTW          CCTAAGGAAGTAGAAAAGAACACAGTGCGCGACTTCCCGATTCCTAAGATTCGTGATGTG
9VSP           CCTAAGGAAGTAGAAAAGAACACAGTGCGCGACTTCCCGATTCCTAAGATTCGTGATGTG
TIGR4          CCTAAGGAAGTAGAACAGAACACAGTGCGCGACTTCCCGATTCCTAAGATTCGTGATGTG
23FTW          CCTAAGGAAGTAGAACAGAACACAGTGCGCGACTTCCCGATTCCTAAGATTCGTGATGTG
               *************** ******************************************* 

14CSR          CGAAAGTATCCAGAAATCACAATTCCAAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT
670            CGAAAGTATCCAGAAATCACAATTCCAAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT
6BF            CGAAAGTATCCAGAAATCACAATTCCAAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT
6BSP           CGAAAGTATCCAGAAATCACAATTCCAAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT
19AH           CGAAAGTATCCAGAAATCACAATTCCAAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT
23FPO          CGAAAGTATCCAGAAATCACAATTCCAAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT
19FTW          CGAAAATATCCAGCAATTACGATTGCAAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT
9VSP           CGAAAATATCCAGCAATTACGATTGCAAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT
TIGR4          CGGAAGTATCCAGAAATCACAATTTCAAAAGAGAAAAAACTTGGTGACATTGAGTTTATT
23FTW          CGGAAGTATCCAGAAATCACAATTTCAAAAGAGAAAAAACTTGGTGACATTGAGTTTATT
               ** ** ******* *** ** *** ********************** ************
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Figure 196O

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14CSR           AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA
670             AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA
6BF             AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA
6BSP            AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA
19AH            AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA
23FPO           AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA
19FTW           AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA
9VSP            AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA
TIGR4           AAGGTCAATAAAAATGATAAAAAACCACTGAGAGGTGCGGTCTTTAGTCTTCAAAAACAA
23FTW           AAGGTCAATAAAAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA
                *** ******* ********************** *************************

14CSR           CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG
670             CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG
6BF             CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG
6BSP            CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG
19AH            CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG
23FPO           CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG
19FTW           CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG
9VSP            CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG
TIGR4           CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG
23FTW           CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG
                ************************************************************

14CSR           AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTCAGATGGGAAATATCGATTA
670             AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTCAGATGGGAAATATCGATTA
6BF             AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTCAGATGGGAAATATCGATTA
6BSP            AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTCAGATGGGAAATATCGATTA
19AH            AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTCAGATGGGAAATATCGATTA
23FPO           AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTCAGATGGGAAATATCGATTA
19FTW           AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTCAGATGGGAAATATCGATTA
9VSP            AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTCAGATGGGAAATATCGATTA
TIGR4           AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTCAGATGGGAAATATCGATTA
23FTW           AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTCAGATGGGAAATATCGATTA
                ************************************************************

14CSR           TTTGAAAATTCTGAACCAGCTGGTTATAAACCCGTTCAAAATAAGCCTATCGTTGCCTTC
670             TTTGAAAATTCTGAACCAGCTGGTTATAAACCCGTTCAAAATAAGCCTATCGTTGCCTTC
6BF             TTTGAAAATTCTGAACCAGCTGGTTATAAACCCGTTCAAAATAAGCCTATCGTTGCCTTC
6BSP            TTTGAAAATTCTGAACCAGCTGGTTATAAACCCGTTCAAAATAAGCCTATCGTTGCCTTC
19AH            TTTGAAAATTCTGAACCAGCTGGTTATAAACCCGTTCAAAATAAGCCTATCGTTGCCTTC
23FPO           TTTGAAAATTCTGAACCAGCTGGTTATAAACCCGTTCAAAATAAGCCTATCGTTGCCTTC
19FTW           TTTGAAAATTCTGAACCAGCTGGTTATAAACCCGTTCAAAATAAGCCTATCGTTGCCTTC
9VSP            TTTGAAAATTCTGAACCAGCTGGTTATAAACCCGTTCAAAATAAGCCTATCGTTGCCTTC
TIGR4           TTTGAAAATTCTGAACCAGCTGGTTATAAACCCGTTCAAAATAAGCCTATCGTTGCCTTC
23FTW           TTTGAAAATTCTGAACCAGCTGGTTATAAACCCGTTCAAAATAAGCCTATCGTTGCCTTC
                ************************************************************

14CSR           CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATACCAGCG
670             CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATACCAGCG
6BF             CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATACCAGCG
6BSP            CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATACCAGCG
19AH            CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATACCAGCG
23FPO           CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATACCAGCG
19FTW           CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATACCAGCG
9VSP            CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATACCAGCG
TIGR4           CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATACCAGCG
23FTW           CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATACCAGCG
                ************************************************************
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Figure 196P

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14CSR          GGTTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCCTCCAAAAAGA
670            GGTTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCCTCCAAAAAGA
6BF            GGTTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCCTCCAAAAAGA
6BSP           GGTTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCCTCCAAAAAGA
19AH           GGTTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCCTCCAAAAAGA
23FPO          GGTTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCCTCCAAAAAGA
19FTW          GGTTACGAGTTTACGAATGATAAGCACTATATTACCAATGAACCTATTCCTCCAAAGAGA
9VSP           GGTTACGAGTTTACGAATGATAAGCACTATATTACCAATGAACCTATTCCTCCAAAGAGA
TIGR4          GGTTACGAGTTTACGAATGATAAGCACTATATTACCAATGAACCTATTCCTCCAAAGAGA
23FTW          GGTTACGAGTTTACGAATGATAAGCACTATATTACCAATGAACCTATTCCTCCAAAGAGA
               ******************************** ** ***** ** *********** ***

14CSR          GAATATCCTCGAACTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG
670            GAATATCCTCGAACTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG
6BF            GAATATCCTCGAACTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG
6BSP           GAATATCCTCGAACTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG
19AH           GAATATCCTCGAACTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG
23FPO          GAATATCCTCGAACTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG
19FTW          GAATATCCTCGAACTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG
9VSP           GAATATCCTCGAACTGGTGGTATCGGAATGTTGCTATTCTATCTGATAGGTTGCATGATG
TIGR4          GAATATCCTCGAACTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG
23FTW          GAATATCCTCGAACTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG
               ********************************** *************************

14CSR          ATGGGAGGAGTTCTATTATACACACGGAAACATCCGTAAAGTGTAGCAATGAGAAATGAT
670            ATGGGAGGAGTTCTATTATACACACGGAAACATCCGTAAAGTGTAGCAATGAGAAATGAT
6BF            ATGGGAGGAGTTCTATTATACACACGGAAACATCCGTAAAGTGTAGCAATGAGAAATGAT
6BSP           ATGGGAGGAGTTCTATTATACACACGGAAACATCCGTAAAGTGTAGCAATGAGAAATGAT
19AH           ATGGGAGGAGTTCTATTATACACACGGAAAAATCCGTAAAGTGTAGCAATGAGAAATGAT
23FPO          ATGGGAGGAGTTCTATTATACACACGGAAAAATCCGTAAAGTGTAGCAATGAGAAATGAT
19FTW          ATGGGAGGAGTTCTATTATACACACGGAAACATCCGTAAAGTGTAG-------AAATGAT
9VSP           ATGGGAGGAGTTCTATTATACACACGGAAACATCCGTAAAGTGTAG-------AAATGAT
TIGR4          ATGGGAGGAGTTCTATTATACACACGGAAACATCCGTAAAGTGTAG-------AAATGAT
23FTW          ATGGGAGGAGTTCTATTATACACACGGAAACATCCGTAAAGTGTAG-------AAATGAT
               ****************************** ***************       *******

14CSR          AATATCGATACTCTGAGCGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA
670            AATATCGATACTCTGAGCGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA
6BF            AATATCGATACTCTGAGCGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA
6BSP           AATATCGATACTCTGAGCGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA
19AH           AATATCGATACTCTGAGCGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA
23FPO          AATATCGATACTCTGAGCGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA
19FTW          AATATCTATGTTCTGAACAATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA
9VSP           AATATCTATGTTCTGAACGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA
TIGR4          AATATCTATGTTCTGAACGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA
23FTW          AATATCTATGTTCTGAACGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA
               ****** **  ***** * *****************************************

14CSR          CTTGGTGAAAACAGTTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA
670            CTTGGTGAAAACAGTTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA
6BF            CTTGGTGAAAACAGTTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA
6BSP           CTTGGTGAAAACAGTTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA
19AH           CTTGGTGAAAACAGTTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA
23FPO          CTTGGTGAAAACAGTTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA
19FTW          CTTGGTGAAACCAGTTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA
9VSP           CTTGGTGAAACCAGTTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA
TIGR4          CTTGGTGAAACCTGTTTTATTCGT-AAGTAAACTATCATTGAAAGGGGAGATGTTTTCGA
23FTW          CTTGGTGAAACCTGTTTTATTCGT-AAGTAAACTATCATTGAAAGGGGAGATGTTTTCGA
               ********** * ***** ****  ******** * ************************
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Figure 196Q

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14CSR      AAACTTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT
670        AAACTTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT
6BF        AAACTTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT
6BSP       AAACTTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT
19AH       AAACTTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT
23FPO      AAACTTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT
19FTW      AAACTTGCACAGAAAAA-GGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT
9VSP       AAACTTGCACAGAAAAA-GGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT
TIGR4      AAACTTGCACAGAAAAA-GGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT
23FTW      AAACTTGCACAGAAAAA-GGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT
           ***************** ******************************************

14CSR      TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTTAACAAT
670        TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTTAACAAT
6BF        TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTTAACAAT
6BSP       TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTTAACAAT
19AH       TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTTAACAAT
23FPO      TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTTAACAAT
19FTW      TGATTTTAAGAGATA--AATAAGGAGAAATCATGAAATCAATCAACAAATTTTTAACAAT
9VSP       TGATTTTAAGAGATA--AATAAGGAGAAATCATGAAATCAATCAACAAATTTTTAACAAT
TIGR4      TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTTAACAAT
23FTW      TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTTAACAAT
           ***************  *******************************************

14CSR      GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTCAGCTGCAACAGTTTTTGCGGC
670        GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTCAGCTGCAACAGTTTTTGCGGC
6BF        GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTCAGCTGCAACAGTTTTTGCGGC
6BSP       GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTCAGCTGCAACAGTTTTTGCGGC
19AH       GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTCAGCTGCAACAGTTTTTGCGGC
23FPO      GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTCAGCTGCAACAGTTTTTGCGGC
19FTW      GCTTGCTGCCTTATTATTGACAGCGAGTAGCCTGTTTTCAGCTGCAACAGTTTTTGCGGC
9VSP       GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTCAGCTGCAACAGTTTTTGCGGC
TIGR4      GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTCAGCTGCAACAGTTTTTGCGGC
23FTW      ACTTGCTGCCTTATTACTGACAGTGAGTAGCCTGTTCTCAGCTGCAACAGTTTTTGCGGC
            *************** ****** ************ ***********************

14CSR      GGACAATGTTAGTACAGCACCAGATGCTGTTACTAAAACTTTAACAATCCATAAGTTACT
670        GGACAATGTTAGTACAGCACCAGATGCTGTTACTAAAACTTTAACAATCCATAAGTTACT
6BF        GGACAATGTTAGTACAGCACCAGATGCTGTTACTAAAACTTTAACAATCCATAAGTTACT
6BSP       GGACAATGTTAGTACAGCACCAGATGCTGTTACTAAAACTTTAACAATCCATAAGTTACT
19AH       GGACAATGTTAGTACAGCACCAGATGCTGTTACTAAAACTTTAACAATCCATAAGTTACT
23FPO      GGACAATGTTAGTACAGCACCAGATGCTGTTACTAAAACTTTAACAATCCATAAGTTACT
19FTW      TGG-GACGACA--ACAACATCTGTTACCGTTCATAAACTATTGGCAACAGATGGGGATAT
9VSP       TGG-GACGACA--ACAACATCTGTTACCGTTCATAAACTATTGGCAACAGATGGGGATAT
TIGR4      TGG-GACGACA--ACAACATCTGTTACCGTTCATAAACTATTGGCAACAGATGGGGATAT
23FTW      GGA-ACAAAAA--ACTAAGACACTTACAGTTCATAAATTATTGATGACAGATCAAGAGCT
            *        *  **     *   * * ***  ****   **    *   **       *

14CSR      GCTCTCA---GAAGATGATTTAAAGACTTGGGATACAAACGGTCCTAA-AGGATATGATG
670        GCTCTCA---GAAGATGATTTAAAGACTTGGGATACAAACGGTCCTAA-AGGATATGATG
6BF        GCTCTCA---GAAGATGATTTAAAGACTTGGGATACAAACGGTCCTAA-AGGATATGATG
6BSP       GCTCTCA---GAAGATGATTTAAAGACTTGGGATACAAACGGTCCTAA-AGGATATGATG
19AH       GCTCTCA---GAAGATGATTTAAAGACTTGGGATACAAACGGTCCTAA-AGGATATGATG
23FPO      GCTCTCA---GAAGATGATTTAAAGACTTGGGATACAAACGGTCCTAA-AGGATATGATG
19FTW      GGATAAAATTGCAAATGAGTTAGAAACAGGTAACTATGCTGGTAATAA-AGTGGGTGTTC
9VSP       GGATAAAATTGCAAATGAGTTAGAAACAGGTAACTATGCTGGTAATAA-AGTGGGTGTTC
TIGR4      GGATAAAATTGCAAATGAGTTAGAAACAGGTAACTATGCTGGTAATAA-AGTGGGTGTTC
23FTW      TGAC------GCTTGGAATTCTGATGCGATTACTACTGCAGGTTATGACGGTTCGCAAAA
                     *      * *   *  *             ***  * *  *
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Figure 196R

```
14CSR           GAACTCAATCTAGTTTAAAAGATTTAACTGGAGTTGTAGCTG----AGGAAATTCCAAAT
670             GAACTCAATCTAGTTTAAAAGATTTAACTGGAGTTGTAGCTG----AGGAAATTCCAAAT
6BF             GAACTCAATCTAGTTTAAAAGATTTAACTGGAGTTGTAGCTG----AGGAAATTCCAAAT
6BSP            GAACTCAATCTAGTTTAAAAGATTTAACTGGAGTTGTAGCTG----AGGAAATTCCAAAT
19AH            GAACTCAATCTAGTTTAAAAGATTTAACTGGAGTTGTAGCTG----AGGAAATTCCAAAT
23FPO           GAACTCAATCTAGTTTAAAAGATTTAACTGGAGTTGTAGCTG----AGGAAATTCCAAAT
19FTW           TACCTGCA---AATGCAAAAGAAATTGCCGGTGTTATGTTCGTTTGGACAAATACTAATA
9VSP            TACCTGCA---AATGCAAAAGAAATTGCCGGTGTTATGTTCGTTTGGACAAATACTAATA
TIGR4           TACCTGCA---AATGCAAAAGAAATTGCCGGTGTTATGTTCGTTTGGACAAATACTAATA
23FTW           T-TTTGAA---CAGTTCAAACAACTTCAAGGTGTTCCACAAG---GAGTAACCGAAATCT
                    *  *         *** *  *    ** ***      *       **     *

14CSR           GTATACTT-------TGAATTACAAAAGTATA-ATTTGACTGATGGT--AAGGAAAAAGA
670             GTATACTT-------TGAATTACAAAAGTATA-ATTTGACTGATGGT--AAGGAAAAAGA
6BF             GTATACTT-------TGAATTACAAAAGTATA-ATTTGACTGATGGT--AAGGAAAAAGA
6BSP            GTATACTT-------TGAATTACAAAAGTATA-ATTTGACTGATGGT--AAGGAAAAAGA
19AH            GTATACTT-------TGAATTACAAAAGTATA-ATTTGACTGATGGT--AAGGAAAAAGA
23FPO           GTATACTT-------TGAATTACAAAAGTATA-ATTTGACTGATGGT--AAGGAAAAAGA
19FTW           ATGAAATTATTGATGAAAATGGCCAAACTCTAGGAGTGAATATTGATCCACAAACATTTA
9VSP            ATGAAATTATTGATGAAAATGGCCAAACTCTAGGAGTGAATATTGATCCACAAACATTTA
TIGR4           ATGAAATTATTGATGAAAATGGCCAAACTCTAGGAGTGAATATTGATCCACAAACATTTA
23FTW           CTGGTGTTGC--ATTCGAGTTACAGAGTTATACGGGTCCTCAAGGA--AAAGAACAAGAA
                 *    **         * *  *  *  * **    *       *    *   * *   *

14CSR           AAATCTTAAAGATGATAGTAAATGGACAACAGTTCATGGTGGTTTGACAACTAAAGATGG
670             AAATCTTAAAGATGATAGTAAATGGACAACAGTTCATGGTGGTTTGACAACTAAAGATGG
6BF             AAATCTTAAAGATGATAGTAAATGGACAACAGTTCATGGTGGTTTGACAACTAAAGATGG
6BSP            AAATCTTAAAGATGATAGTAAATGGACAACAGTTCATGGTGGTTTGACAACTAAAGATGG
19AH            AAATCTTAAAGATGATAGTAAATGGACAACAGTTCATGGTGGTTTGACAACTAAAGATGG
23FPO           AAATCTTAAAGATGATAGTAAATGGACAACAGTTCATGGTGGTTTGACAACTAAAGATGG
19FTW           AACTCTCAGGGGCAATGCCGGC--AACTGCAATGAAAAAATTAACAGAAGCTGAA---GG
9VSP            AACTCTCAGGGGCAATGCCGGC--AACTGCAATGAAAAAATTAACAGAAGCTGAA---GG
TIGR4           AACTCTCAGGGGCAATGCCGGC--AACTGCAATGAAAAAATTAACAGAAGCTGAA---GG
23FTW           AA-TTTAACGAATGATGCGGTTTGGACTGCGGTTAATAAAGGTGTGACGACTGAAACAGG
                ** * * *      **         **  *  *  *              ** **   **

14CSR           ACTTAAAATTGAAACCAGTACTCTTAAAGGTGT---GTATCGTATTCGTGAGGATAGAAC
670             ACTTAAAATTGAAACCAGTACTCTTAAAGGTGT---GTATCGTATTCGTGAGGATAGAAC
6BF             ACTTAAAATTGAAACCAGTACTCTTAAAGGTGT---GTATCGTATTCGTGAGGATAGAAC
6BSP            ACTTAAAATTGAAACCAGTACTCTTAAAGGTGT---GTATCGTATTCGTGAGGATAGAAC
19AH            ACTTAAAATTGAAACCAGTACTCTTAAAGGTGT---GTATCGTATTCGTGAGGATAGAAC
23FPO           ACTTAAAATTGAAACCAGTACTCTTAAAGGTGT---GTATCGTATTCGTGAGGATAGAAC
19FTW           AGCTAAATTTAACACGGCAAATTTACCAGCTGCTAAGTATAAAATTTATGAAATTCACAG
9VSP            AGCTAAATTTAACACGGCAAATTTACCAGCTGCTAAGTATAAAATTTATGAAATTCACAG
TIGR4·          AGCTAAATTTAACACGGCAAATTTACCAGCTGCTAAGTATAAAATTTATGAAATTCACAG
23FTW           TGTTAAATTTGATACTGAAGTTTTACAAGGGAC---ATATCGTCTTGTCGAAGTACGTAA
                   **** ** * **      * *   **        ***    **   **       *

14CSR           AAAGACTACCTATGTTGGTCCTAATGGGCAAGTATTAACAGGTTCAAAAGCCGTACCTGC
670             AAAGACTACCTATGTTGGTCCTAATGGGCAAGTATTAACAGGTTCAAAAGCCGTACCTGC
6BF             AAAGACTACCTATGTTGGTCCTAATGGGCAAGTATTAACAGGTTCAAAAGCCGTACCTGC
6BSP            AAAGACTACCTATGTTGGTCCTAATGGGCAAGTATTAACAGGTTCAAAAGCCGTACCTGC
19AH            AAAGACTACCTATGTTGGTCCTAATGGGCAAGTATTAACAGGTTCAAAAGCCGTACCTGC
23FPO           AAAGACTACCTATGTTGGTCCTAATGGGCAAGTATTAACAGGTTCAAAAGCCGTACCTGC
19FTW           TTTATCAACTTATGTCGGTGAAGATGGAGCAACCTTAACAGGTTCTAAAGCAGTTCCAAT
9VSP            TTTATCAACTTATGTCGGTGAAGATGGAGCAACCTTAACAGGTTCTAAAGCAGTTCCAAT
TIGR4           TTTATCAACTTATGTCGGTGAAGATGGAGCAACCTTAACAGGTTCTAAAGCAGTTCCAAT
23FTW           AGAATCGACTTATGTCGGTCCAAATGGTAAAGTTTTAACAGGTATGAAAGCTGTTCCTGC
                     * ** ***** ***    ****   *   *********   ***** ** **
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Figure 196S

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14CSR          TCTTGTAACTCTTCCACTTGTTAACAATAATGGTACAGTAATTGATGCACATGTTTTCCC
670            TCTTGTAACTCTTCCACTTGTTAACAATAATGGTACAGTAATTGATGCACATGTTTTCCC
6BF            TCTTGTAACTCTTCCACTTGTTAACAATAATGGTACAGTAATTGATGCACATGTTTTCCC
6BSP           TCTTGTAACTCTTCCACTTGTTAACAATAATGGTACAGTAATTGATGCACATGTTTTCCC
19AH           TCTTGTAACTCTTCCACTTGTTAACAATAATGGTACAGTAATTGATGCACATGTTTTCCC
23FPO          TCTTGTAACTCTTCCACTTGTTAACAATAATGGTACAGTAATTGATGCACATGTTTTCCC
19FTW          TGAAATTGAATTACCATT---------GAACGATGTTGTGGA---TGCGCATGTGTATCC
9VSP           TGAAATTGAATTACCATT---------GAACGATGTTGTGGA---TGCGCATGTGTATCC
TIGR4          TGAAATTGAATTACCATT---------GAACGATGTTGTGGA---TGCGCATGTGTATCC
23FTW          TTTAATTACTCTGCCGCTTGTAAACCAAAATGGTGTTGTAGAAAATGCACATGTCTATCC
               *    *     * **  *          ** * *   **      *** ***** *  **

14CSR          TAAAAATTCATATAATAAACCAGTTGTAGATAAAAGAATTGCTGATACTTTGAATTATAA
670            TAAAAATTCATATAATAAACCAGTTGTAGATAAAAGAATTGCTGATACTTTGAATTATAA
6BF            TAAAAATTCATATAATAAACCAGTTGTAGATAAAAGAATTGCTGATACTTTGAATTATAA
6BSP           TAAAAATTCATATAATAAACCAGTTGTAGATAAAAGAATTGCTGATACTTTGAATTATAA
19AH           TAAAAATTCATATAATAAACCAGTTGTAGATAAAAGAATTGCTGATACTTTGAATTATAA
23FPO          TAAAAATTCATATAATAAACCAGTTGTAGATAAAAGAATTGCTGATACTTTGAATTATAA
19FTW          AAAAAATACAGAAGCAAAGCCAAAAATTGATAAAGATTTCAAAGGTAAAGCAAATCCAGA
9VSP           AAAAAATACAGAAGCAAAGCCAAAAATTGATAAAGATTTCAAAGGTAAAGCAAATCCAGA
TIGR4          AAAAAATACAGAAGCAAAGCCAAAAATTGATAAAGATTTCAAAGGTAAAGCAAATCCAGA
23FTW          AAAGAATTCTGAAGACAAACCTACAGCAACGAAAACATTTGATACTGCAGCAGGTTTCGT
                ** *** *  *    ** **          ***    *      *        *

14CSR          CGATCAA---------AATGGTCTGTCTATCGGTACTAAAATCCCATATGTTGT----TA
670            CGATCAA---------AATGGTCTGTCTATCGGTACTAAAATCCCATATGTTGT----TA
6BF            CGATCAA---------AATGGTCTGTCTATCGGTACTAAAATCCCATATGTTGT----TA
6BSP           CGATCAA---------AATGGTCTGTCTATCGGTACTAAAATCCCATATGTTGT----TA
19AH           CGATCAA---------AATGGTCTGTCTATCGGTACTAAAATCCCATATGTTGT----TA
23FPO          CGATCAA---------AATGGTCTGTCTATCGGTACTAAAATCCCATATGTTGT----TA
19FTW          TACACCACGTGTAGATAAAGATACACCTGTGAACCACCAAGTTGGAGATGTTGTAGAGTA
9VSP           TACACCACGTGTAGATAAAGATACACCTGTGAACCACCAAGTTGGAGATGTTGTAGAGTA
TIGR4          TACACCACGTGTAGATAAAGATACACCTGTGAACCACCAAGTTGGAGATGTTGTAGAGTA
23FTW          AGATCCAGGTG---AAAAAGGTTTAGCAATTGGCACTAAGGTACCGTATATTGT----TA
                   * *         **   *    *  *        *  *     ** ****    **

14CSR          ATACAACAATTCCAAGTAATGCAACATT---------TGCAACTTCATTTTGGTCAGATG
670            ATACAACAATTCCAAGTAATGCAACATT---------TGCAACTTCATTTTGGTCAGATG
6BF            ATACAACAATTCCAAGTAATGCAACATT---------TGCAACTTCATTTTGGTCAGATG
6BSP           ATACAACAATTCCAAGTAATGCAACATT---------TGCAACTTCATTTTGGTCAGATG
19AH           ATACAACAATTCCAAGTAATGCAACATT---------TGCAACTTCATTTTGGTCAGATG
23FPO          ATACAACAATTCCAAGTAATGCAACATT---------TGCAACTTCATTTTGGTCAGATG
19FTW          CGA-AATTGTTACAAAAATTCCAGCACTTGCTAATTATGCAACAGCAAACTGGAGCGATA
9VSP           CGA-AATTGTTACAAAAATTCCAGCACTTGCTAATTATGCAACAGCAAACTGGAGCGATA
TIGR4          CGA-AATTGTTACAAAAATTCCAGCACTTGCTAATTATGCAACAGCAAACTGGAGCGATA
23FTW          CAACAACTATTCCGAAAAACTCAACTCT---------TGCAACAGCTTTCTGGTCAGATG
                 * **   ** * *  *   ** *  *         ******  *    ***   ***

14CSR          AAATGACAGAAGGTCTAACTTATAATGAAGA-GTAACAA---TTACTTTGAATAATGTAG
670            AAATGACAGAAGGTCTAACTTATAATGAAGATGTAACAA---TTACTTTGAATAATGTAG
6BF            AAATGACAGAAGGTCTAACTTATAATGAAGATGTAACAA---TTACTTTGAATAATGTAG
6BSP           AAATGACAGAAGGTCTAACTTATAATGAAGATGTAACAA---TTACTTTGAATAATGTAG
19AH           AAATGACAGAAGGTCTAACTTATAATGAAGATGTAACAA---TTACTTTGAATAATGTAG
23FPO          AAATGACAGAAGGTCTAACTTATAATGAAGATGTAACAA---TTACTTTGAATAATGTAG
19FTW          GAATGACTGAAGGTTTGGCATTCAACAAAGGTACAGTGAAAGTAACTGTTGATGATGTTG
9VSP           GAATGACTGAAGGTTTGGCATTCAACAAAGGTACAGTGAAAGTAACTGTTGATGATGTTG
TIGR4          GAATGACTGAAGGTTTGGCATTCAACAAAGGTACAGTGAAAGTAACTGTTGATGATGTTG
23FTW          AAATGACAGAAGGTCTAGATTATAATGGTGATGTAGTT---GTTAATTATAATGGTCAAC
                ****** ****** *    *  **    *    *       * * *    **  *
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Figure 196T

```
14CSR           CTATGGATCAAGCTGATTATGAAGTCACTAAAGGAAATAATGGCTTTAACTTAAAATTAA
670             CTATGGATCAAGCTGATTATGAAGTCACTAAAGGAAATAATGGCTTTAACTTAAAATTAA
6BF             CTATGGATCAAGCTGATTATGAAGTCACTAAAGGAAATAATGGCTTTAACTTAAAATTAA
6BSP            CTATGGATCAAGCTGATTATGAAGTCACTAAAGGAAATAATGGCTTTAACTTAAAATTAA
19AH            CTATGGATCAAGCTGATTATGAAGTCACTAAAGGAAYTAATGGCTTTAACTTAAAATTAA
23FPO           CTATGGATCAAGCTGATTATGAAGTCACTAAAGGAATTAATGGCTTTAACTTAAAATTAA
19FTW           CACTTGAAGCAGGTGATTATGCTCTAACAGAAGTAGCAACTGGTTTTGATTTGAAATTAA
9VSP            CACTTGAAGCAGGTGATTATGCTCTAACAGAAGTAGCAACTGGTTTTGATTTGAAATTAA
TIGR4           CACTTGAAGCAGGTGATTATGCTCTAACAGAAGTAGCAACTGGTTTTGATTTGAAATTAA
23FTW           CGCTTGATAATTCTCATTACACATTAGAAGCAGGTCATAATGGCTTTATCTTGAAGTTAA
                *  * **      * ****     *      **     * *** ***   ** ** ****

14CSR           CAGAAGCAGGTTTAGCTAAAATTAATGGTAAGGATGCAGACCAAAAAATCCAAATTACTT
670             CAGAAGCAGGTTTAGCTAAAATTAATGGTAAGGATGCAGACCAAAAAATCCAAATTACTT
6BF             CAGAAGCAGGTTTAGCTAAAATTAATGGTAAGGATGCAGACCAAAAAATCCAAATTACTT
6BSP            CAGAAGCAGGTTTAGCTAAAATTAATGGTAAGGATGCAGACCAAAAAATCCAAATTACTT
19AH            CAGAAGCAGGTTTAGCTAAAATTAATGGTAAGGATGCAGACCAAAAAATCCAAATTACTT
23FPO           CAGAAGCAGGTTTAGCTAAAATTAATGGTAAGGATGCAGACCAAAAAATCCAAATTACTT
19FTW           CAGATGCTGGTTTAGCTAAAGTGAATGACCAAAACGCTGAAAAAACTGTGAAAATCACTT
9VSP            CAGATGCTGGTTTAGCTAAAGTGAATGACCAAAACGCTGAAAAAACTGTGAAAATCACTT
TIGR4           CAGATGCTGGTTTAGCTAAAGTGAATGACCAAAACGCTGAAAAAACTGTGAAAATCACTT
23FTW           ATGAAAAAGGTCTGGAAGCAATCAACGGTAAAGATGCAGAAGCAACAATTACGTTGAAGT
                  **    *** * *    * * ** *   *  * ** **   **   *     * *  *

14CSR           ACTCAGCTACTTTGAACTCACTTGCTGTTGCAGACATTCCTGAAAGTAACGATATTACAT
670             ACTCAGCTACTTTGAACTCACTTGCTGTTGCAGACATTCCTGAAAGTAACGATATTACAT
6BF             ACTCAGCTACTTTGAACTCACTTGCTGTTGCAGACATTCCCGAAAGTAACGATATTACAT
6BSP            ACTCAGCTACTTTGAACTCACTTGCTGTTGCAGACATTCCTGAAAGTAACGATATTACAT
19AH            ACTCAGCTACTTTGAACTCACTTGCTGTTGCAGACATTCCTGAAAGTAACGATATTACAT
23FPO           ACTCAGCTACTTTGAACTCACTTGCTGTTGCAGACATTCCTGAAAGTAACGATATTACAT
19FTW           ATTCGGCAACATTGAATGACAAAGCAATTGTAGAAGTACCAGAATCTAATGATGTAACAT
9VSP            ATTCGGCAACATTGAATGACAAAGCAATTGTAGAAGTACCAGAATCTAATGATGTAACAT
TIGR4           ATTCGGCAACATTGAATGACAAAGCAATTGTAGAAGTACCAGAATCTAATGATGTAACAT
23FTW           ATACTGCAACTTTAAATGCTCTTGCTGTTGCTGATGTGCCAGAAGCGAATGATGTAACAT
                *  * ** ** ** **       **  ***  **  * ** ***   ** *** * ****

14CSR           ATCATTACGGAAATCATCAAGATCATGGGAATACTCCAAAACCAACTAAACC---TAATA
670             ATCATTACGGAAATCATCAAGATCATGGGAATACTCCAAAACCAACTAAACC---TAATA
6BF             ATCATTACGGAAATCATCAAGATCATGGGAATACTCCAAAACCAACTAAACC---TAATA
6BSP            ATCATTACGGAAATCATCAAGATCATGGGAATACTCCAAAACCAACTAAACC---TAATA
19AH            ATCATTACGGAAATCATCAAGATCATGGGAATACTCCAAAACCAACTAAACC---TAATA
23FPO           ATCATTACGGAAATCATCAAGATCATGGGAATACTCCAAAACCAACTAAACC---TAATA
19FTW           TTAACTATGGTAATAATCCAGATCACGGGAATACTCCAAAGCCGAATAAGCCAAATGAAA
9VSP            TTAACTATGGTAATAATCCAGATCACGGGAATACTCCAAAGCCGAATAAGCCAAATGAAA
TIGR4           TTAACTATGGTAATAATCCAGATCACGGGAATACTCCAAAGCCGAATAAGCCAAATGAAA
23FTW           TCCATTATGGAAACAACCCAGGTCATGGTAACACTCCAAAACCAAACAAACC---TAAAA
                   * ** ** **  * * ** *** ** ** ******** ** *  ** **   * * *

14CSR           ATGGTCAAATTACAGTAACTAAGACATGGG--------ACAGTCA-ACCTGCTCCTGAGG
670             ATGGTCAAATTACAGTAACTAAGACATGGG--------ACAGTCA-ACCTGCTCCTGAGG
6BF             ATGGTCAAATTACAGTAACTAAGACATGGG--------ACAGTCA-ACCTGCTCCTGAGG
6BSP            ATGGTCAAATTACAGTAACTAAGACATGGG--------ACAGTCA-ACCTGCTCCTGAGG
19AH            ATGGTCAAATTACAGTAACTAAGACATGGG--------ACAGTCA-ACCTGCTCCTGAGG
23FPO           ATGGTCAAATTACAGTAACTAAGACATGGG--------ACAGTCA-ACCTGCTCCTGAGG
19FTW           ACGGCGATTTGACATTGACCAAGACATGGGTTGATGCTACAGGTGCACCAATTCCGGCTG
9VSP            ACGGCGATTTGACATTGACCAAGACATGGGTTGATGCTACAGGTGCACCAATTCCGGCTG
TIGR4           ACGGCGATTTGACATTGACCAAGACATGGGTTGATGCTACAGGTGCACCAATTCCGGCTG
23FTW           ACGGTGAACTTACAATTACTAAAACATGGGCTGATGCTAAAGATGCTCCTAT---AGCAG
                * **  *  * *** * ** ** *******        * **     **       *  *
```

Figure 196U

```
14CSR           GGGTGAAAGCGACTGTTCAACTTGTAAATGCCAAGACTGGTGAGAAAGTCGGTGCTCC--
670             GGGTGAAAGCGACTGTTCAACTTGTAAATGCCAAGACTGGTGAGAAAGTCGGTGCTCC--
6BF             GGGTGAAAGCGACTGTTCAACTTGTAAATGCCAAGACTGGTGAGAAAGTCGGTGCTCC--
6BSP            GGGTGAAAGCGACTGTTCAACTTGTAAATGCCAAGACTGGTGAGAAAGTCGGTGCTCC--
19AH            GGGTGAAAGCGACTGTTCAACTTGTAAATGCCAAGACTGGTGAGAAAGTCGGTGCTCC--
23FPO           GGGTGAAAGCGACTGTTCAACTTGTAAATGCCAAGACTGGTGAGAAAGTCGGTGCTCC--
19FTW           GAGCTGAAGCAACGTTCGATTTGGTTAATGCTCAGACTGGTAAAGTTGTACAAAC-----
9VSP            GAGCTGAAGCAACGTTCGATTTGGTTAATGCTCAGACTGGTAAAGTTGTACAAAC-----
TIGR4           GAGCTGAAGCAACGTTCGATTTGGTTAATGCTCAGACTGGTAAAGTTGTACAAAC-----
23FTW           GTGTAGAAGTAACTTTTGATTTGGTAAATGCTCAGACAGGTGAGGTCGTTAAAGTACCTG
                * *   ***  **  *  *  * ** *****  **** *** *    **

14CSR           -------------TGTAGAACTTTC---AGAAAATAATTGGACATATACTTGGAGTGGTC
670             -------------TGTAGAACTTTC---AGAAAATAATTGGACATATACTTGGAGTGGTC
6BF             -------------TGTAGAACTTTC---AGAAAATAATTGGACATATACTTGGAGTGGTC
6BSP            -------------TGTAGAACTTTC---AGAAAATAATTGGACATATACTTGGAGTGGTC
19AH            -------------TGTAGAACTTTC---AGAAAATAATTGGACATATACTTGGAGTGGTC
23FPO           -------------TGTAGAACTTTC---AGAAAATAATTGGACATATACTTGGAGTGGTC
19FTW           -------------TGTAACTTTGAC---AACAGACAAAAATACAGTTACTGTTAACGGAT
9VSP            -------------TGTAACTTTGAC---AACAGACAAAAATACAGTTACTGTTAACGGAT
TIGR4           -------------TGTAACTTTGAC---AACAGACAAAAATACAGTTACTGTTAACGGAT
23FTW           GACATGAAACAGGTATTGTATTGAATCAAACAAATAATTGGACATTTACTGCTACAGGTC
                             * *     *      *  * * **    ***  ****   *  **

14CSR           TAGATAATTCTATTGAATACAAAGTTGAAGAA--GAATAT-AATGGATACTCAGCTGAAT
670             TAGATAATTCTATTGAATACAAAGTTGAAGAA--GAATAT-AATGGATACTCAGCTGAAT
6BF             TAGATAATTCTATTGAATACAAAGTTGAAGAA--GAATAT-AATGGATACTCAGCTGAAT
6BSP            TAGATAATTCTATTGAATACAAAGTTGAAGAA--GAATAT-AATGGATACTCAGCTGAAT
19AH            TAGATAATTCTATTGAATACAAAGTTGAAGAA--GAATAT-AATGGATACTCAGCTGAAT
23FPO           TAGATAATTCTATTGAATACAAAGTTGAAGAA--GAATAT-AATGGATACTCAGCTGAAT
19FTW           TGGATAAAAATACAGAATATAAATTCGTTGAACGTAGTATAAAAGGGTATTCAGCAGATT
9VSP            TGGATAAAAATACAGAATATAAATTCGTTGAACGTAGTATAAAAGGGTATTCAGCAGATT
TIGR4           TGGATAAAAATACAGAATATAAATTCGTTGAACGTAGTATAAAAGGGTATTCAGCAGATT
23FTW           TTGATAATAATACAGAATATAAATTTGTTGAACGGACAATTAAGGGATATTCTGCAGATT
                * *****   **  ***** *** * *  ***   *  ** ** ** ** ** ** ** *

14CSR           ACACAGTAGAGAGCAAA---GGGAAGTTGGGGGTAAAAAACTGGAAAGATAATAACCCAG
670             ACACAGTAGAGAGCAAA---GGGAAGTTGGGGGTAAAAAACTGGAAAGATAATAACCCAG
6BF             ACACAGTAGAGAGCAAA---GGGAAGTTGGGGGTAAAAAACTGGAAAGATAATAACCCAG
6BSP            ACACAGTAGAGAGCAAA---GGGAAGTTGGGGGTAAAAAACTGGAAAGATAATAACCCAG
19AH            ACACAGTAGAGAGCAAA---GGGAAGTTGGGGGTAAAAAACTGGAAAGATAATAACCCAG
23FPO           ACACAGTAGAGAGCAAA---GGGAAGTTGGGGGTAAAAAACTGGAAAGATAATAACCCAG
19FTW           ATCAAGAAATCACTACAGCTGGAGAAATTGCTGTCAAGAACTGGAAAGACGAAAATCCAA
9VSP            ATCAAGAAATCACTACAGCTGGAGAAATTGCTGTCAAGAACTGGAAAGACGAAAATCCAA
TIGR4           ATCAAGAAATCACTACAGCTGGAGAAATTGCTGTCAAGAACTGGAAAGACGAAAATCCAA
23FTW           ACCAAACAATTACTGAAACAGGAAAAATTGCTGTTAAAAACTGGAAAGATGAAAATCCAG
                *   *  *   *    *   **  *  * *  ** ** ***********  * ** ***

14CSR           CTCCAATCAATC-TGAAGAACCACGTGTAAAAACATACGGTAAAAAGTTTGTCAAAGTAG
670             CTCCAATCAATCCTGAAGAACCACGTGTAAAAACATACGGTAAAAAGTTTGTCAAAGTAG
6BF             CTCCAATCAATCCTGAAGAACCACGTGTAAAAACATACGGTAAAAAGTTTGTCAAAGTAG
6BSP            CTCCAATCAATCCTGAAGAACCACGTGTAAAAACATACGGTAAAAAGTTTGTCAAAGTAG
19AH            CTCCAATCAATCCTGAAGAACCACGTGTAAAAACATACGGTAAAAAGTTTGTCAAAGTAG
23FPO           CTCCAATCAATCTTGAAGAACCACGTGTAAAAACATACGGTAAAAAGTTTGTCAAAGTAG
19FTW           AACCACTTGATCCAACAGAGCCAAAAGTTGTTACATATGGTAAAAAGTTTGTCAAAGTTA
9VSP            AACCACTTGATCCAACAGAGCCAAAAGTTGTTACATATGGTAAAAAGTTTGTCAAAGTTA
TIGR4           AACCACTTGATCCAACAGAGCCAAAAGTTGTTACATATGGTAAAAAGTTTGTCAAAGTTA
23FTW           AACCAATAAATCCTGAAGAGCCACGTGTAAAAACATATGGTAAAAAATTCGTTAAGGTTG
                  *** *  ***    *** ***   **    ***** ******** ** ** ** **
```

Figure 196V

```
14CSR           ACCAAAAAGATACTCGTCTAGAAAATGCGCAGTTCGTTGTTAAAAAAGCAGATAGC---A
670             ACCAAAAAGATACTCGTCTAGAAAATGCGCAGTTCGTTGTTAAAAAAGCAGATAGC---A
6BF             ACCAAAAAGATACTCGTCTAGAAAATGCGCAGTTCGTTGTTAAAAAAGCAGATAGC---A
6BSP            ACCAAAAAGATACTCGTCTAGAAAATGCGCAGTTCGTTGTTAAAAAAGCAGATAGC---A
19AH            ACCAAAAAGATACTCGTCTAGAAAATGCGCAGTTCGTTGTTAAAAAAGCAGATAGC---A
23FPO           ACCAAAAAGATACTCGTCTAGAAAATGCGCAGTTCGTTGTTAAAAAAGCAGATAGC---A
19FTW           ATGATAAAGATAATCGTTTAGCTGGGGCAGAATTTGTAATTGCAAATGCTGATAATGCTG
9VSP            ATGATAAAGATAATCGTTTAGCTGGGGCAGAATTTGTAATTGCAAATGCTGATAATGCTG
TIGR4           ATGATAAAGATAATCGTTTAGCTGGGGCAGAATTTGTAATTGCAAATGCTGATAATGCTG
23FTW           ACCAAAAAGACGAACGCTTAAAAGAAGCACAATTCGTTGTGAAGAATG--AGCAA----G
                *  * *****    **  **      **  * ** **  *    ** *     *

14CSR           ATAAATATATTGCCTTTAAGTCAACTGCACAACAAGCT--GCAGATGAAAAAGCAGCAGC
670             ATAAATATATTGCCTTTAAGTCAACTGCACAACAAGCT--GCAGATGAAAAAGCAGCAGC
6BF             ATAAATATATTGCCTTTAAGTCAACTGCACAACAAGCT--GCAGATGAAAAAGCAGCAGC
6BSP            ATAAATATATTGCCTTTAAGTCAACTGCACAACAAGCT--GCAGATGAAAAAGCAGCAGC
19AH            ATAAATATATTGCCTTTAAGTCAACTGCACAACAAGCT--GCAGATGAAAAAGCAGCAGC
23FPO           ATAAATATATTGCCTTTAAGTCAACTGCACAACAAGCT--GCAGATGAAAAAGCAGCAGC
19FTW           GTCAATATTTAGCACGTAAAGCAG--ATAAAGTGAGTCAAGAAGAGAAGCAGTTGGTTGT
9VSP            GTCAATATTTAGCACGTAAAGCAG--ATAAAGTGAGTCAAGAAGAGAAGCAGTTGGTTGT
TIGR4           GTCAATATTTAGCACGTAAAGCAG--ATAAAGTGAGTCAAGAAGAGAAGCAGTTGGTTGT
23FTW           GGAAATATCTTGCACTCAAATCTGCAGCACAACAAGCT--GTAAATGAGAAAGCTGCCGC
                   ***** * **    **  *      * *   **    * * *  *  *    *  *

14CSR           AACTGCAAAACAAAAATTGGATGCAGCGGTAGCAGCTTACA---CAAATGCTGCAGATAA
670             AACTGCAAAACAAAAATTGGATGCAGCGGTAGCAGCTTACA---CAAATGCTGCAGATAA
6BF             AACTGCAAAACAAAAATTGGATGCAGCGGTAGCAGCTTACA---CAAATGCTGCAGATAA
6BSP            AACTGCAAAACAAAAATTGGATGCAGCGGTAGCAGCTTACA---CAAATGCTGCAGATAA
19AH            AACTGCAAAACAAAAATTGGATGCAGCGGTAGCAGCTTACA---CAAATGCTGCAGATAA
23FPO           AACTGCAAAACAAAAATTGGATGCAGCGGTAGCAGCTTACA---CAAATGCTGCAGATAA
19FTW           TACAACAAAGGATGCTTTAGATAGAGCAGTTGCTGCTTATAACGCTCTTACTGCACAACA
9VSP            TACAACAAAGGATGCTTTAGATAGAGCAGTTGCTGCTTATAACGCTCTTACTGCACAACA
TIGR4           TACAACAAAGGATGCTTTAGATAGAGCAGTTGCTGCTTATAACGCTCTTACTGCACAACA
23FTW           AGAAGCGAAACAAGCGCTAGATGCAGCGATAGCAGCCTATA---CAAATGCTGCA-GATA
                     * **  *     * ***  ***  * ** ** ** *   *   * *****    *

14CSR           GCAAGCCGCTCAA------GCTCTAGTAGATCAAGCACAGCAAGAATACAATGTAGCTTA
670             GCAAGCCGCTCAA------GCTCTAGTAGATCAAGCACAGCAAGAATACAATGTAGCTTA
6BF             GCAAGCCGCTCAA------GCTCTAGTAGATCAAGCACAGCAAGAATACAATGTAGCTTA
6BSP            GCAAGCCGCTCAA------GCTCTAGTAGATCAAGCACAGCAAGAATACAATGTAGCTTA
19AH            GCAAGCCGCTCAA------GCTCTAGTAGATCAAGCACAGCAAGAATACAATGTAGCTTA
23FPO           GCAAGCCGCTCAA------GCTCTAGTAGATCAAGCACAGCAAGAATACAATGTAGCTTA
19FTW           ACAAACTCAGCAAGAAAAAGAGAAAGTTGACAAAGCTCAAGCTGCTTATAATGCTGCTGT
9VSP            ACAAACTCAGCAAGAAAAAGAGAAAGTTGACAAAGCTCAAGCTGCTTATAATGCTGCTGT
TIGR4           ACAAACTCAGCAAGAAAAAGAGAAAGTTGACAAAGCTCAAGCTGCTTATAATGCTGCTGT
23FTW           A-AAATGCAGCAC----AAGCTGTAGTAGATGCTGCGCAAAAAACATATAATGACAATTA
                  **      **       *    *** **    ** **       ** ****    *

14CSR           CAAAGAAGCCAA------ATTTGGTTATGTTGAAGTAGCTGGAAAAGATGAAGCAATGGT
670             CAAAGAAGCCAA------ATTTGGTTATGTTGAAGTAGCTGGAAAAGATGAAGCAATGGT
6BF             CAAAGAAGCCAA------ATTTGGTTATGTTGAAGTAGCTGGAAAAGATGAAGCAATGGT
6BSP            CAAAGAAGCCAA------ATTTGGTTATGTTGAAGTAGCTGGAAAAGATGAAGCAATGGT
19AH            CAAAGAAGCCAA------ATTTGGTTATGTTGAAGTAGCTGGAAAAGATGAAGCAATGGT
23FPO           CAAAGAAGCCAA------ATTTGGTTATGTTGAAGTAGCTGGAAAAGATGAAGCAATGGT
19FTW           GATTGCTGCCAACAATGCATTTGAATGGGTGGCAGATAAGGACAATGAAAATGTTGTGAA
9VSP            GATTGCTGCCAACAATGCATTTGAATGGGTGGCAGATAAGGACAATGAAAATGTTGTGAA
TIGR4           GATTGCTGCCAACAATGCATTTGAATGGGTGGCAGATAAGGACAATGAAAATGTTGTGAA
23FTW           CAGAGCAGCTAG------ATTTGGCTATGTAGAAGTAGAGAGAAAAGAAGATGCGTTAGT
                 *  *  ** *       *****  *  ** * **        ** **  * *   *
```

Figure 196W

```
14CSR           TCTTACTTCTAATACGGATGGTCAATTCCAAATTTCAGGTCTTGCTGCTGGTACTTATAA
670             TCTTACTTCTAATACGGATGGTCAATTCCAAATTTCAGGTCTTGCTGCTGGTACTTATAA
6BF             TCTTACTTCTAATACGGATGGTCAATTCCAAATTTCAGGTCTTGCTGCTGGTACTTATAA
6BSP            TCTTACTTCTAATACGGATGGTCAATTCCAAATTTCAGGTCTTGCTGCTGGTACTTATAA
19AH            TCTTACTTCTAATACGGATGGTCAATTCCAAATTTCAGGTCTTGCTGCTGGTACTTATAA
23FPO           TCTTACTTCTAATACGGATGGTCAATTCCAAATTTCAGGTCTTGCTGCTGGTACTTATAA
19FTW           ATTAGTTTCTGATGCACAAGGTCGCTTTGAAATTACAGGCCTTCTTGCAGGTACATATTA
9VSP            ATTAGTTTCTGATGCACAAGGTCGCTTTGAAATTACAGGCCTTCTTGCAGGTACATATTA
TIGR4           ATTAGTTTCTGATGCACAAGGTCGCTTTGAAATTACAGGCCTTCTTGCAGGTACATATTA
23FTW           TCTTACTTCTAACACTGATGGTCAATTCCAAATTTCAGGTCTTGCTGCTGGAAGCTACAC
                  *   **** *  *  * ****  **  ***** **** ***  *** ** *  **

14CSR           ATTAGAAGAAATTAAAGCTCCAGAAGGTTTTGCGAAAAT---TGATGATGTAGAATTTGT
670             ATTAGAAGAAATTAAAGCTCCAGAAGGTTTTGCGAAAAT---TGATGATGTAGAATTTGT
6BF             ATTAGAAGAAATTAAAGCTCCAGAAGGTTTTGCGAAAAT---TGATGATGTAGAATTTGT
6BSP            ATTAGAAGAAATTAAAGCTCCAGAAGGTTTTGCGAAAAT---TGATGATGTAGAATTTGT
19AH            ATTAGAAGAAATTAAAGCTCCAGAAGGTTTTGCGAAAAT---TGATGATGTAGAATTTGT
23FPO           ATTAGAAGAAATTAAAGCTCCAGAAGGTTTTGCGAAAAT---TGATGATGTAGAATTTGT
19FTW           CTTAGAAGAAACAAAACAGCCTGCTGGTTATGCATTACTAACTAGCCGTCAGAAATTTGA
9VSP            CTTAGAAGAAACAAAACAGCCTGCTGGTTATGCATTACTAACTAGTCGTCAGAAATTTGA
TIGR4           CTTAGAAGAAACAAAACAGCCTGCTGGTTATGCATTACTAACTAGCCGTCAGAAATTTGA
23FTW           GTTGGAAGAAACAAAAGCTCCAGAAGGCTTTGCAAAACT---TGGAGATGTGAAGTTTGA
                 ** *******  ***   ** *  ** * ***   * *   *     *    * ****

14CSR           TGTTGGAGCAGGTTCTTG------GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA
670             TGTTGGAGCAGGTTCTTG------GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA
6BF             TGTTGGAGCAGGTTCTTG------GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA
6BSP            TGTTGGAGCAGGTTCTTG------GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA
19AH            TGTTGGAGCAGGTTCTTG------GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA
23FPO           TGTTGGAGCAGGTTCTTG------GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA
19FTW           AGTCACTGCAACTTCTTATTCAGCGACTGGACAAGGCATTGAGTATACTGCTGGTTCAGG
9VSP            AGTCACTGCAACTTCTTATTCAGCGACTGGACAAGGCATTGAGTATACTGCTGGTTCAGG
TIGR4           AGTCACTGCAACTTCTTATTCAGCGACTGGACAAGGCATTGAGTATACTGCTGGTTCAGG
23FTW           GGTTGGAGCAGGTTCTTG------GAATCAAGGTGATTTCAATTATTTAAAAGATGTTCA
                 **    ***  *****       ** *  *   *   *  * **       * *

14CSR           AAAGAATGACGCTACAAAAGTAGTCAACAAAAAAATCACTATCCCACAAACGGGTGGTAT
670             AAAGAATGACGCTACAAAAGTAGTCAACAAAAAAATCACTATCCCACAAACGGGTGGTAT
6BF             AAAGAATGACGCTACAAAAGTAGTCAACAAAAAAATCACTATCCCACAAACGGGTGGTAT
6BSP            AAAGAATGACGCTACAAAAGTAGTCAACAAAAAAATCACTATCCCACAAACGGGTGGTAT
19AH            AAAGAATGACGCTACAAAAGTAGTCAACAAAAAAATCACTATCCCACAAACGGGTGGTAT
23FPO           AAAGAATGACGCTACAAAAGTAGTCAACAAAAAAATCACGATCCCACAAACGGGTGGTAT
19FTW           TAAAGATGACGCTACAAAAGTAGTCAACAAAAAAATCACGATCCCACAAACGGGTGGTAT
9VSP            TAAAGATGACGCTACAAAAGTAGTCAACAAAAAAATCACGATCCCACAAACGGGTGGTAT
TIGR4           TAAAGATGACGCTACAAAAGTAGTCAACAAAAAAATCACTATCCCACAAACGGGTGGTAT
23FTW           GAAGAACGACGCTACAAAAGTAGTCAACAAAAAAATCACGATCCCTCAAACGGGTGGTAT
                 **  * ******************************** ***** **************

14CSR           TGGTACAATTATCTTTGCTGTAGCGGGGGCTGCGATTATGGGTATTGCAGTGTACGCATA
670             TGGTACAATTATCTTTGCTGTAGCGGGGGCTGCGATTATGGGTATTGCAGTGTACGCATA
6BF             TGGTACAATTATCTTTGCTGTAGCGGGGGCTGCGATTATGGGTATTGCAGTGTACGCATA
6BSP            TGGTACAATTATCTTTGCTGTAGCGGGGGCTGCGATTATGGGTATTGCAGTGTACGCATA
19AH            TGGTACAATTATCTTTGCTGTAGCGGGGGCTGCGATTATGGGTATTGCAGTGTACGCATA
23FPO           TGGTACAATTATCTTTGCTGTAGCAGGGGCTGTGATTATGGGTATTGCAGTGTACGCATA
19FTW           TGGTACAATTATCTTTGCTGTAGCAGGGGCTGTGATTATGGGTATTGCAGTGTACGCATA
9VSP            TGGTACAATTATCTTTGCTGTAGCAGGGGCTGTGATTATGGGTATTGCAGTGTACGCATA
TIGR4           TGGTACAATTATCTTTGCTGTAGCGGGGGCTGCGATTATGGGTATTGCAGTGTACGCATA
23FTW           TGGTACAATTATCTTTGCTGTAGCGGGGGCTGTGATTATGGGTATTGCAGTGTACGCATA
                ************************ ******* ***************************
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Figure 196X

```
14CSR      TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAGGAGCCATTGA
670        TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAGGAGCCATTGA
6BF        TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAGGAGCCATTGA
6BSP       TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAGGAGCCATTGA
19AH       TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAGGAGCCATTGA
23FPO      TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAGGAGCCATTGA
19FTW      TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAGGAGCCATTGA
9VSP       TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAGGAGCCATTGA
TIGR4      TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAGGAGCCATTGA
23FTW      TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAGGAGCCATTGA
           ************************************************************

14CSR      TGACAATGCAGAAAATGCAGAAAATG----------------------------------
670        TGACAATGCAGAAAATGCAGAAAATG----------------------------------
6BF        TGACAATGCAGAAAATGCAGAAAATG----------------------------------
6BSP       TGACAATGCAGAAAATGCAGAAAATG----------------------------------
19AH       TGACAATGCAGAAAATGCAGAAAATG----------------------------------
23FPO      TGACAATGCAGAAAATGCAGAAAATG----------------------------------
19FTW      TGACAATGCAGAAAATGCAGAAAATG----------------------------------
9VSP       TGACAATGCAGAAAATGCAGAAAATGCAGAAAATGCAGAAAATGCAGAAAATGCAGAAAA
TIGR4      TGACAATGCAGAAAATGCAGAAAATG----------------------------------
23FTW      TGACAATGCAGAAAATGCAGAAAATG----------------------------------
           **************************

14CSR      --ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTTCTCTTGTATGGGGTGCACATG
670        --ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTTCTCTTGTATGGGGTGCACATG
6BF        --ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTTCTCTTGTATGGGGTGCACATG
6BSP       --ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTTCTCTTGTATGGGGTGCACATG
19AH       --ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTTCTCTTGTATGGGGTGCACATG
23FPO      --ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTTCTCTTGTATGGGGTGCACATG
19FTW      --ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTTCTCTTGTATGGGGTGCACATG
9VSP       TGATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTTCTCTTGTATGGGGTGCACATG
TIGR4      --ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTTCTCTTGTATGGGGTGCACATG
23FTW      --ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTTCTCTTGTATGGGGTGCACATG
             **********************************************************

14CSR      CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACTATCAGGAGGTGG
670        CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACTATCAGGAGGTGG
6BF        CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACTATCAGGAGGTGG
6BSP       CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACTATCAGGAGGTGG
19AH       CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACTATCAGGAGGTGG
23FPO      CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACTATCAGGAGGTGG
19FTW      CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACTATCAGGAGGTGG
9VSP       CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACTATCAGGAGGTGG
TIGR4      CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACTATCAGGAGGTGG
23FTW      CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACTATCAGGAGGTGG
           ************************************************************

14CSR      TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT
670        TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT
6BF        TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT
6BSP       TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT
19AH       TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT
23FPO      TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAGGTATGGAAGTTGGATGATTCGT
19FTW      TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAGGTATGGAAGTTGGATGATTCGT
9VSP       TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAGGTATGGAAGTTGGATGATTCGT
TIGR4      TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT
23FTW      TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAGGTATGGAAGTTGGATGATTCGT
           ************************************* **********************
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Figure 196Y

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14CSR           ATTCCTATGATGATCGGGTGCAAATTGTAAGAGACTTGCATTCGTGGGATGAGAATAAAC
670             ATTCCTATGATGATCGGGTGCAAATTGTAAGAGACTTGCATTCGTGGGATGAGAATAAAC
6BF             ATTCCTATGATGATCGGGTGCAAATTGTAAGAGACTTGCATTCGTGGGATGAGAATAAAC
6BSP            ATTCCTATGATGATCGGGTGCAAATTGTAAGAGACTTGCATTCGTGGGATGAGAATAAAC
19AH            ATTCCTATGATGATCGGGTGCAAATTGTAAGAGACTTGCATTCGTGGGATGAGAATAAAC
23FPO           ATTCCTATGATAATCGGGTGCAAATTGTGAGAGACTTGCATTCGTGGGATGAGAATAAAC
19FTW           ATTCCTATGATAATCGGGTGCAAATTGTGAGAGACTTGCATTCGTGGGATGAGAATAAAC
9VSP            ATTCCTATGATAATCGGGTGCAAATTGTGAGAGACTTGCATTCGTGGGATGAGAATAAAC
TIGR4           ATTCCTATGATGATCGGGTGCAAATTGTAAGAGACTTGCATTCGTGGGATGAGAATAAAC
23FTW           ATTCCTATGATAATCGGGTGCAAATTGTGAGAGACTTGCATTCGTGGGATGAGAATAAAC
                *********** **************** *******************************

14CSR           TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT
670             TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT
6BF             TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT
6BSP            TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT
19AH            TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT
23FPO           TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT
19FTW           TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT
9VSP            TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT
TIGR4           TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT
23FTW           TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT
                ************************************************************

14CSR           CTCATATTCCAAATGGTCTTTACTATGTTCGCTCTATTATCCAGACGGATGCGGTTTCTT
670             CTCATATTCCAAATGGTCTTTACTATGTTCGCTCTATTATCCAGACGGATGCGGTTTCTT
6BF             CTCATATTCCAAATGGTCTTTACTATGTTCGCTCTATTATCCAGACGGATGCGGTTTCTT
6BSP            CTCATATTCCAAATGGTCTTTACTATGTTCGCTCTATTATCCAGACGGATGCGGTTTCTT
19AH            CTCATATTCCAAATGGTCTTTACTATGTTCGCTCTATTATCCAGACGGATGCGGTTTCTT
23FPO           CTCATATTCCAAATGGTCTTTACTATGTTCGCTCTATTATCCAGACGGATGCGGTTTCTT
19FTW           CTCATATTCCAAATGGTCTTTACTATGTTCGCTCTATTATCCAGACGGATGCGGTTTCTT
9VSP            CTCATATTCCAAATGGTCTTTACTATGTTCGCTCTATTATCCAGACGGATGCGGTTTCTT
TIGR4           CTCATATTCCAAATGGTCTTTACTATGTTCGCTCTATTATCCAGACGGATGCGGTTTCTT
23FTW           CTCATATTCCAAATGGTCTTTACTATGTTCGCTCTATTATCCAGACGGATGCGGTTTCTT
                ************************************************************

14CSR           ATCCAGCTGAATTTCTTTTTGAAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG
670             ATCCAGCTGAATTTCTTTTTGAAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG
6BF             ATCCAGCTGAATTTCTTTTTGAAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG
6BSP            ATCCAGCTGAATTTCTTTTTGAAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG
19AH            ATCCAGCTGAATTTCTTTTTGAAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG
23FPO           ATCCAGCTGAATTTCTTTTTGAAATGACAGATCAGACGGTAGAGCCTTTGGTCATTGTAG
19FTW           ATCCAGCTGAATTTCTTTTTGAAATGACAGATCAGACGGTAGAGCCTTTGGTCATTGTAG
9VSP            ATCCAGCTGAATTTCTTTTTGAAATGACAGATCAGACGGTAGAGCCTTTGGTCATTGTAG
TIGR4           ATCCAGCTGAATTTCTTTTTGAAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG
23FTW           ATCCAGCTGAATTTCTTTTTGAAATGACAGATCAGACGGTAGAGCCTTTGGTCATTGTAG
                ********************************** *************************

14CSR           CGAAAAAAACAGATACAATGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA
670             CGAAAAAAACAGATACAATGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA
6BF             CGAAAAAAACAGATACAATGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA
6BSP            CGAAAAAAACAGATACAATGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA
19AH            CGAAAAAAACAGATACAATGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA
23FPO           CGAAAAAAGCAGATACGGTGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA
19FTW           CGAAAAAAGCAGATACGGTGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA
9VSP            CGAAAAAAGCAGATACGGTGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA
TIGR4           CGAAAAAAACAGATACAATGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA
23FTW           CGAAAAAAGCAGATACGGTGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA
                ******** *******  ******************************************
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Figure 196X

419/487

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14CSR          ATCGCTTGGAGGGTGTCGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG
670            ATCGCTTGGAGGGTGTCGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG
6BF            ATCGCTTGGAGGGTGTCGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG
6BSP           ATCGCTTGGAGGGTGTCGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG
19AH           ATCGCTTGGAGGGTGTCGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG
23FPO          ATCGCTTGGAGGGTGTCGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG
19FTW          ATCGCTTGGAGGGTGTCGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG
9VSP           ATCGCTTGGAGGGTGTCGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG
TIGR4          ATCGCTTGGAGGGTGTCGGCTTTAAATTGGTATCAGTAGCAAGAGATGTTTCTGAAAAAG
23FTW          ATCGCTTGGAGGGTGTCGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG
               ************************************************ ***********

14CSR          AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCTTCTGGTCAAGTAGGGAGAACTCTCT
670            AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCTTCTGGTCAAGTAGGGAGAACTCTCT
6BF            AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCTTCTGGTCAAGTAGGGAGAACTCTCT
6BSP           AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCTTCTGGTCAAGTAGGGAGAACTCTCT
19AH           AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCTTCTGGTCAAGTAGGGAGAACTCTCT
23FPO          AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCTTCTGGTCAAGTAGGGAGAACTCTCT
19FTW          AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCTTCTGGTCAAGTAGGGAGAACTCTCT
9VSP           AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCTTCTGGTCAAGTAGGGAGAACTCTCT
TIGR4          AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCTTCTGGTCAAGTAGGGAGAACTCTCT
23FTW          AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCTTCTGGTCAAGTAGGGAGAACTCTCT
               ************************************************************

14CSR          ATACTGATAAAAATGGAGAGATTTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA
670            ATACTGATAAAAATGGAGAGATTTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA
6BF            ATACTGATAAAAATGGAGAGATTTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA
6BSP           ATACTGATAAAAATGGAGAGATTTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA
19AH           ATACTGATAAAAATGGAGAGATTTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA
23FPO          ATACTGATAAAAATGGAGAGATTGTTGTGACAAATCTTCCTCTTGGGACCTATCGTTTCA
19FTW          ATACTGATAAAAATGGAGAGATTGTTGTGACAAATCTTCCTCTTGGGACCTATCGTTTCA
9VSP           ATACTGATAAAAATGGAGAGATTGTTGTGACAAATCTTCCTCTTGGGACCTATCGTTTCA
TIGR4          ATACTGATAAAAATGGAGAGATTTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA
23FTW          ATACTGATAAAAATGGAGAGATTGTTGTGACAAATCTTCCTCTTGGGACCTATCGTTTCA
               *********************** ************************ ***********

14CSR          AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGCTGG
670            AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGCTGG
6BF            AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGCTGG
6BSP           AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGCTGG
19AH           AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGCTGG
23FPO          AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGATGGATACGGATGTCCAGTTGG
19FTW          AGGAGGTGGAGCCACTGGCAGGCTATACTGTTACGACGATGGATACGGATGTCCAGTTGG
9VSP           AGGAGGTGGAGCCACTGGCAGGCTATACTGTTACGACGATGGATACGGATGTCCAGTTGG
TIGR4          AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGCTGG
23FTW          AGGAGGTGGAGCCACTGGCAGGCTATACTGTTACGACGATGGATACGGATGTCCAGTTGG
               ************************** *********** ***************** ***

14CSR          TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG
670            TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG
6BF            TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG
6BSP           TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG
19AH           TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG
23FPO          TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG
19FTW          TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG
9VSP           TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG
TIGR4          TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG
23FTW          TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG
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Figure 196AA

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14CSR     ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA
670       ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA
6BF       ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA
6BSP      ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA
19AH      ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA
23FPO     ACTTTATGAAGGTGGATGGTAGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA
19FTW     ACTTTATGAAGGTGGATGGTAGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA
9VSP      ACTTTATGAAGGTGGATGGTAGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA
TIGR4     ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA
23FTW     ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA
          ******************** ***************************************

14CSR     TGAAAGAAGAAAGCGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTAA
670       TGAAAGAAGAAAGCGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTAA
6BF       TGAAAGAAGAAAGCGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTAA
6BSP      TGAAAGAAGAAAGCGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTAA
19AH      TGAAAGAAGAAAGCGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTAA
23FPO     TGAAAGAAGAAAACGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTGG
19FTW     TGAAAGAAGAAAACGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTGG
9VSP      TGAAAGAAGAAAACGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTGG
TIGR4     TGAAAGAAGAAAGCGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTAA
23FTW     TGAAAGAAGAAAACGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTGG
          ************ *********************************************

14CSR     CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT
670       CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT
6BF       CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT
6BSP      CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT
19AH      CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT
23FPO     CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT
19FTW     CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT
9VSP      CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT
TIGR4     CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT
23FTW     CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT
          ************************************************************

14CSR     GGGAGCTCCAAGCTCCAACTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG
670       GGGAGCTCCAAGCTCCAACTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG
6BF       GGGAGCTCCAAGCTCCAACTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG
6BSP      GGGAGCTCCAAGCTCCAACTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG
19AH      GGGAGCTCCAAGCTCCAACTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG
23FPO     GGGAGCTCCAAGCTCCAACTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG
19FTW     GGGAGCTCCAAGCTCCAACTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG
9VSP      GGGAGCTCCAAGCTCCAACTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG
TIGR4     GGGAGCTCCAAGCTCCAACTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG
23FTW     GGGAGCTCCAAGCTCCAACTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG
          ************************************************************

14CSR     GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG
670       GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG
6BF       GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG
6BSP      GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG
19AH      GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG
23FPO     GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG
19FTW     GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG
9VSP      GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG
TIGR4     GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG
23FTW     GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG
          ************************************************************
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Figure 196AB

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14CSR         ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTTGCCATTTTGTTGT
670           ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTTGCCATTTTGTTGT
6BF           ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTTGCCATTTTGTTGT
6BSP          ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTTGCCATTTTGTTGT
19AH          ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTTGCCATTTTGTTGT
23FPO         ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTTGCCATTTTGTTGT
19FTW         ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTTGCCATTTTGTTGT
9VSP          ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTTGCCATTTTGTTGT
TIGR4         ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTTGCCATTTTGTTGT
23FTW         ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTTGCCATTTTGTTGT
              ************************************************************

14CSR         TTGGTAGTGGTTATTATCTTACGAAAAAACCAAATAACTGATATTCAATGTACATCATTA
670           TTGGTAGTGGTTATTATCTTACGAAAAAACCAAATAACTGATATTCAATGTACATCATTA
6BF           TTGGTAGTGGTTATTATCTTACGAAAAAACCAAATAACTGATATTCAATGTACATCATTA
6BSP          TTGGTAGTGGTTATTATCTTACGAAAAAACCAAATAACTGATATTCAATGTACATCATTA
19AH          TTGGTAGTGGTTATTATCTTACGAAAAAACCAAATAACTGATATTCAATGTACATCATTA
23FPO         TTGGTAGTGGCTATTATCTTACGAAAAAAACAAATAACTGATATTCAATGTACATCATTA
19FTW         TTGGTAGTGGCTATTATCTTACGAAAAAAACAAATAACTGATATTCAATGTACATCATTA
9VSP          TTGGTAGTGGCTATTATCTTACGAAAAAAACAAATAACTGATATTCAATGTACATCATTA
TIGR4         TTGGTAGTGGTTATTATCTTACGAAAAAACCAAATAACTGATATTCAATGTACATCATTA
23FTW         TTGGTAGTGGCTATTATCTTACGAAAAAAACAAATAACTGATATTCAATGTACATCATTA
              ********** ****************** ******************************

14CSR         TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA
670           TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA
6BF           TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA
6BSP          TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA
19AH          TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA
23FPO         TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA
19FTW         TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA
9VSP          TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA
TIGR4         TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA
23FTW         TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA
              ************************************************************

14CSR         TCATGGTGATGTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC
670           TCATGGTGATGTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC
6BF           TCATGGTGATGTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC
6BSP          TCATGGTGATGTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC
19AH          TCATGGTGATGTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC
23FPO         TCATGGTGATTTGGCATGAATCATAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC
19FTW         TCATGGTGATTTGGCATGAATCATAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC
9VSP          TCATGGTGATTTGGCATGAATCATAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC
TIGR4         TCATGGTGATGTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC
23FTW         TCATGGTGATTTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC
              ********** ************ ************************************

14CSR         TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG
670           TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG
6BF           TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG
6BSP          TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG
19AH          TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG
23FPO         TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG
19FTW         TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG
9VSP          TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG
TIGR4         TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG
23FTW         TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG
              ************************************************************
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Figure 196AC

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14CSR        ACAGGACTGGGATTCTGATTTAAAATGGATGGTGAATCAGAAAGAAATGAGATTTTCTCG
670          ACAGGACTGGGATTCTGATTTAAAATGGATGGTGAATCAGAAAGAAATGAGATTTTCTCG
6BF          ACAGGACTGGGATTCTGATTTAAAATGGATGGTGAATCAGAAAGAAATGAGATTTTCTCG
6BSP         ACAGGACTGGGATTCTGATTTAAAATGGATGGTGAATCAGAAAGAAATGAGATTTTCTCG
19AH         ACAGGACTGGGATTCTGATTTAAAATGGATGGTGAATCAGAAAGAAATGAGATTTTCTCG
23FPO        ACAGGACTGGGATTCTGATTTAAAATGGATGGTGAATCAGAAAGAAATGAGATTTTCTCG
19FTW        ACAGGACTGGGATTCTGATTTAAAATGGATGGTGAATCAGAAAGAAATGAGATTTTCTCG
9VSP         ACAGGACTGGGATTCTGATTTAAAATGGATGGTGAATCAGAAAGAAATGAGATTTTCTCG
TIGR4        ACAGGACTGGGATTCTGATTTAAAATGGATGGTGAATCAGAAAGAAATGAGATTTTCTCG
23FTW        ACAGGACTGGGATTCTGATTTAAAATGGATGGTGAATCAGAAAGAAATGAGATTTTCTCG
             ************************************************************

14CSR        TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGAT
670          TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGAT
6BF          TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGAT
6BSP         TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGAT
19AH         TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGAT
23FPO        TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGTT
19FTW        TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGTT
9VSP         TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGTT
TIGR4        TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGAT
23FTW        TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGAT
             ********************************************************** *

14CSR        AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAAGCAAAAACGAAATAATCTCCTATT
670          AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAAGCAAAAACGAAATAATCTCCTATT
6BF          AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAAGCAAAAACGAAATAATCTCCTATT
6BSP         AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAAGCAAAAACGAAATAATCTCCTATT
19AH         AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAAGCAAAAACGAAATAATCTCCTATT
23FPO        AAAGGAATGCTGATAAAAAATGGCAAAAACAAAAAAGCAAAAACGAAACAATCTCCTATT
19FTW        AAAGGAATGCTGATAAAAAATGGCAAAAACAAAAAAGCAAAAACGAAACAATCTCCTATT
9VSP         AAAGGAATGCTGATAAAAAATGGCAAAAACAAAAAAGCAAAAACGAAACAATCTCCTATT
TIGR4        AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAAGCAAAAACGAAATAATCTCCTATT
23FTW        AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAAGCAAAAACGAAATAATCTCCTATT
             ***** ************* *** ************************ ***********

14CSR        AGGAGTGGTATTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA
670          AGGAGTGGTATTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA
6BF          AGGAGTGGTATTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA
6BSP         AGGAGTGGTATTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA
19AH         AGGAGTGGTATTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA
23FPO        AGGAGTGGTATTTTTCATTGGAATAGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA
19FTW        AGGAGTGGTATTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA
9VSP         AGGAGTGGTATTTTTCATTGGAATAGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA
TIGR4        AGGAGTGGTATTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA
23FTW        AGGAGTGGTATTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA
             ************************ ***********************************

14CSR        TTATCGAGTGGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA
670          TTATCGAGTGGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA
6BF          TTATCGAGTGGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA
6BSP         TTATCGAGTGGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA
19AH         TTATCGAGTGGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA
23FPO        TTATCGAGTGGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA
19FTW        TTATCGAGTGGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA
9VSP         TTATCGAGTGGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA
TIGR4        TTATCGAGTGGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA
23FTW        TTATCGAGTGGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA
             ************************************************************
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Figure 196AD

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14CSR           TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAGCCTTCAATGACTCTTTGAATAA
670             TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAGCCTTCAATGACTCTTTGAATAA
6BF             TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAGCCTTCAATGACTCTTTGAATAA
6BSP            TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAGCCTTCAATGACTCTTTGAATAA
19AH            TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAGCCTTCAATGACTCTTTGAATAA
23FPO           TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAGCCTTCAATGACTCTTTGAATAA
19FTW           TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAGCCTTCAATGACTCTTTGAATAA
9VSP            TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAGCCTTCAATGACTCTTTGAATAA
TIGR4           TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAGCCTTCAATGACTCTTTGAATAA
23FTW           TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAGCCTTCAATGACTCTTTGAATAA
                ************************************************************

14CSR           TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC
670             TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC
6BF             TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC
6BSP            TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC
19AH            TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC
23FPO           TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC
19FTW           TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC
9VSP            TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC
TIGR4           TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC
23FTW           TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC
                ************************************************************

14CSR           ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA
670             ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA
6BF             ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA
6BSP            ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA
19AH            ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA
23FPO           ACGCATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCTGCTATTGATGTAGA
19FTW           ACGCATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCTGCTATTGATGTAGA
9VSP            ACGCATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCTGCTATTGATGTAGA
TIGR4           ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA
23FTW           ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA
                *** ***************************************** * ****** ** **

14CSR           TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA
670             TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA
6BF             TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA
6BSP            TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA
19AH            TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA
23FPO           TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGCGCTGGACATCTAGA
19FTW           TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGCGCTGGACATCTAGA
9VSP            TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGCGCTGGACATCTAGA
TIGR4           TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA
23FTW           TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCAGCTAGA
                ********************************************* ***** ** *****

14CSR           GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG
670             GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG
6BF             GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG
6BSP            GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG
19AH            GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG
23FPO           GGGAACTTCTCTACCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG
19FTW           GGGAACTTCTCTACCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG
9VSP            GGGAACTTCTCTACCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG
TIGR4           GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG
23FTW           GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG
                ************ ***********************************************
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Figure 196AE

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14CSR           TTTGCCAACAGCTAAGATGTTTACGGATTTGACCAAACTTAAAGTTGGGGATAAGTTTTA
670             TTTGCCAACAGCTAAGATGTTTACGGATTTGACCAAACTTAAAGTTGGGGATAAGTTTTA
6BF             TTTGCCAACAGCTAAGATGTTTACGGATTTGACCAAACTTAAAGTTGGGGATAAGTTTTA
6BSP            TTTGCCAACAGCTAAGATGTTTACGGATTTGACCAAACTTAAAGTTGGGGATAAGTTTTA
19AH            TTTGCCAACAGCGAAGATGTTTACGGATTTGACCAAACTTAAAGTTGGGGATAAGTTTTA
23FPO           TTTGCCAACGGCTAAGATGTTTACGGATTTGACCAAACTTAAAGTTGGGGATAAGTTTTA
19FTW           TTTGCCAACGGCTAAGATGTTTACGGATTTGACCAAACTTAAAGTTGGGGATAAGTTTTA
9VSP            TTTGCCAACGGCTAAGATGTTTACGGATTTGACCAAACTTAAAGTTGGGGATAAGTTTTA
TIGR4           TTTGCCAACAGCTAAGATGTTTACGGATTTGACCAAACTTAAAGTTGGGGATAAGTTTTA
23FTW           TTTGCCAACAGCTAAGATGTTTACGGATTTGACCAAACTTAAAGTTGGGGATAAGTTTTA
                ********* ** ***********************************************

14CSR           TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC
670             TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC
6BF             TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC
6BSP            TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC
19AH            TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC
23FPO           TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC
19FTW           TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC
9VSP            TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC
TIGR4           TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC
23FTW           TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC
                ************************************************************

14CSR           GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG
670             GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG
6BF             GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG
6BSP            GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG
19AH            GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG
23FPO           GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACCTG
19FTW           GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACCTG
9VSP            GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACCTG
TIGR4           GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG
23FTW           GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG
                ********************************************************* **

14CSR           TACGCCATACATGATCAATACCCATCGTCTATTGGTTCGGGGGCATCGGATACCGTACGT
670             TACGCCATACATGATCAATACCCATCGTCTATTGGTTCGGGGGCATCGGATACCGTACGT
6BF             TACGCCATACATGATCAATACCCATCGTCTATTGGTTCGGGGGCATCGGATACCGTACGT
6BSP            TACGCCATACATGATCAATACCCATCGTCTATTGGTTCGGGGGCATCGGATACCGTACGT
19AH            TACGCCATACATGATCAATACCCATCGTCTATTGGTTCGGGGGCATCGGATACCGTACGT
23FPO           TACGCCATACATGATCAATACCCATCGTCTATTGGTTCGGGGGCATCGGATACCGTACGT
19FTW           TACGCCATACATGATCAATACCCATCGTCTATTGGTTCGGGGGCATCGGATACCGTACGT
9VSP            TACGCCATACATGATCAATACCCATCGTCTATTGGTTCGGGGGCATCGGATACCGTACGT
TIGR4           TACGCCATACATGATCAATACCCATCGTCTATTGGTTCGGGGGCATCGGATACCGTACGT
23FTW           TACGCCATACATGATCAATACCCATCGTCTATTGGTTCGGGGGCATCGGATACCGTACGT
                ************************************************************

14CSR           AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAAACTCAGTCATCTCTATCGCTACCT
670             AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAAACTCAGTCATCTCTATCGCTACCT
6BF             AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAAACTCAGTCATCTCTATCGCTACCT
6BSP            AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAAACTCAGTCATCTCTATCGCTACCT
19AH            AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAAACTCAGTCATCTCTATCGCTACCT
23FPO           AGCAGAGGTTGAGGAAGAATTTATTGCGGCAAACAAACTCAGTCATCTCTATCGCTACCT
19FTW           AGCAGAGGTTGAGGAAGAATTTATTGCGGCAAACAAACTCAGTCATCTCTATCGCTACCT
9VSP            AGCAGAGGTTGAGGAAGAATTTATTGCGGCAAACAAACTCAGTCATCTCTATCGCTACCT
TIGR4           AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAAACTCAGTCATCTCTATCGCTACCT
23FTW           AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAAACTCAGTCATCTCTATCGCTACCT
                *************************** ********************************
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Figure 196AF

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14CSR           GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTCGACGCTTGCGCAA
670             GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTCGACGCTTGCGCAA
6BF             GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTCGACGCTTGCGCAA
6BSP            GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTCGACGCTTGCGCAA
19AH            GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTCGACGCTTGCGCAA
23FPO           GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTCGACGCTTGCGCAA
19FTW           GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTCGACGCTTGCGCAA
9VSP            GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTCGACGCTTGCGCAA
TIGR4           GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTCGACGCTTGCGCAA
23FTW           GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTCGACGCTTGCGCAA
                ************************************************************

14CSR           GAAGAAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA
670             GAAGAAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA
6BF             GAAGAAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA
6BSP            GAAGAAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA
19AH            GAAGAAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA
23FPO           GAAGAAACGGCAATCAGAAAGAGCTTTGAAAGCATTGAAGGAAGCTACTAAGGAAGTGAA
19FTW           GAAGAAACGGCAATCAGAAAGAGCTTTGAAAGCATTGAAGGAAGCTACTAAGGAAGTGAA
9VSP            GAAGAAACGGCAATCAGAAAGAGCTTTGAAAGCATTGAAGGAAGCTACTAAGGAAGTGAA
TIGR4           GAAGAAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA
23FTW           GAAGAAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA
                *******   *** * ****  ******** **  **** * *** *  ***********

14CSR           GGTGGAGGATGGACAACAGTAGACGTTCACGAAAAAAAGGCACAAAAAAGAAGAAACATC
670             GGTGGAGGATGGACAACAGTAGACGTTCACGAAAAAAAGGCACAAAAAAGAAGAAACATC
6BF             GGTGGAGGATGGACAACAGTAGACGTTCACGAAAAAAAGGCACAAAAAAGAAGAAACATC
6BSP            GGTGGAGGATGGACAACAGTAGACGTTCACGAAAAAAAGGCACAAAAAAGAAGAAACATC
19AH            GGTGGAGGATGGACAACAGTAGACGTTCACGAAAAAAAGGCACAAAAAAGAAGAAACATC
23FPO           GGTAGAGGATGAGTAAGAGTAGATATTCACGGAAAAAGAGCGTGAAAAAGAAGAAAAATC
19FTW           GGTAGAGGATGAGTAAGAGTAGATATTCACGGAAAAAGAGCGTGAAAAAGAAGAAAAATC
9VSP            GGTAGAGGATGAGTAAGAGTAGATATTCACGGAAAAAGAGCGTGAAAAAGAAGAAAAATC
TIGR4           GGTGGAGGATGGACAACAGTAGACGTTCACGAAAAAAAGGCACAAAAAAGAAGAAACATC
23FTW           GGTGGAGGATGGACAACAGTAGACGTTCACGAAAAAAAGGCACAAAAAAGAAGAAACATC
                *** *******   ** ****** ****** *****  **   ************ ***

14CSR           CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTCGCCGTTGCGATATATCCATTGGTGT
670             CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTCGCCGTTGCGATATATCCATTGGTGT
6BF             CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTCGCCGTTGCGATATATCCATTGGTGT
6BSP            CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTCGCCGTTGCGATATATCCATTGGTGT
19AH            CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTCGCCGTTGCGATATATCCATTGGTGT
23FPO           CGTTCATTCTTCTTCTGATTTTTTTGGTGGGGCTTGCCGTTGCGATGTATCCCTTGGTGT
19FTW           CGTTCATTCTTCTTCTGATTTTTTTGGTGGGGCTTGCCGTTGCGATGTATCCCTTGGTGT
9VSP            CGTTCATTCTTCTTCTGATTTTTTTGGTGGGGCTTGCCGTTGCGATGTATCCCTTGGTGT
TIGR4           CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTCGCCGTTGCGATATATCCATTGGTGT
23FTW           CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTCGCCGTTGCGATATATCCATTGGTGT
                ** * ** ************** ** ** **  * *********** ***** *******

14CSR           CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAAGAGTTTGATGAGACGGTTT
670             CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAAGAGTTTGATGAGACGGTTT
6BF             CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAAGAGTTTGATGAGACGGTTT
6BSP            CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAAGAGTTTGATGAGACGGTTT
19AH            CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAAGAGTTTGATGAGACGGTTT
23FPO           CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAAGAGTTTGATGAGACGGTTT
19FTW           CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAAGAGTTTGATGAGACGGTTT
9VSP            CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAAGAGTTTGATGAGACGGTTT
TIGR4           CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAAGAGTTTGATGAGACGGTTT
23FTW           CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAAGAGTTTGATGAGACGGTTT
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Figure 196AG

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14CSR           CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA
670             CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA
6BF             CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA
6BSP            CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA
19AH            CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA
23FPO           CCCAGATGGATAAGGCGGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA
19FTW           CCCAGATGGATAAGGCGGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA
9VSP            CCCAGATGGATAAGGCGGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA
TIGR4           CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA
23FTW           CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA
                **************** *******************************************

14CSR           CCTTGAAACCATCTGAAATTCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT
670             CCTTGAAACCATCTGAAATTCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT
6BF             CCTTGAAACCATCTGAAATTCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT
6BSP            CCTTGAAACCATCTGAAATTCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT
19AH            CCTTGAAACCATCTGAAATTCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT
23FPO           CCTTGAAACCATCTGAAATTCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT
19FTW           CCTTGAAACCATCTGAAATCCTCGATCCTTTTACAGATCAGGAAAAGAAACAGGGAGTTT
9VSP            CCTTGAAACCATCTGAAATTCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT
TIGR4           CCTTGAAACCATCTGAAATTCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT
23FTW           CCTTGAAACCATCTGAAATTCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT
                ******************* ** ************** ** ** ** **  * ** ** *

14CSR           CAGAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA
670             CAGAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA
6BF             CAGAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA
6BSP            CAGAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA
19AH            CAGAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA
23FPO           CAGAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA
19FTW           CAGAATATGCTAACATGCTAAAAGTTCATGAGCGTATCGGATATGTAGAAATTCCTGCGA
9VSP            CAGAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA
TIGR4           CAGAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA
23FTW           CAGAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA
                ********** ** ******** ** ******** ** ** ***** *************

14CSR           TTGATCAGGAAATTCCGATGTATGTCGGAACGAGTGAGGAAATTCTTCAGAAGGGCGCAG
670             TTGATCAGGAAATTCCGATGTATGTCGGAACGAGTGAGGAAATTCTTCAGAAGGGCGCAG
6BF             TTGATCAGGAAATTCCGATGTATGTCGGAACGAGTGAGGAAATTCTTCAGAAGGGCGCAG
6BSP            TTGATCAGGAAATTCCGATGTATGTCGGAACGAGTGAGGAAATTCTTCAGAAGGGCGCAG
19AH            TTGATCAGGAAATTCCGATGTATGTCGGAACGAGTGAGGAAATTCTTCAGAAGGGCGCAG
23FPO           TTGATCAGGAAATTCCGATGTATGTCGGAACGAGTGAGGAAATTCTTCAGAAGGGCGCAG
19FTW           TTGAACAGGAAATCCCCATGTATGTTGGCACAAGTGAAGACATTCTTCAGAAAGGGGCAG
9VSP            TTGATCAGGAAATTCCGATGTATGTCGGAACGAGTGAGGAAATTCTTCAGAAGGGCGCAG
TIGR4           TTGATCAGGAAATTCCGATGTATGTCGGAACGAGTGAGGACATTCTTCAGAAAGGGGCAG
23FTW           TTGATCAGGAAATTCCGATGTATGTCGGAACGAGTGAGGAAATTCTTCAGAAGGGCGCAG
                **** ******** ** ******** ** ** ***** ** *********** ** ****

14CSR           GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAAAATACCCACACAGTTGTCACTG
670             GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAAAATACCCACACAGTTGTCACTG
6BF             GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAAAATACCCACACAGTTGTCACTG
6BSP            GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAAAATACCCACACAGTTGTCACTG
19AH            GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAAAATACCCACACAGTTGTCACTG
23FPO           GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAAAATACCCACACAGTTGTCACTG
19FTW           GGCTGTTAGAAGGGGCTTCGCTGCCTGTTGGAGGTGAAAATACCCATACAGTGATCACTG
9VSP            GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAAAATACCCACACAGTTGTCACTG
TIGR4           GGCTGTTAGAAGGGGCTTCGCTGCCTGTTGGAGGTGAAAATACCCATACAGTGATCACTG
23FTW           GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAAAATACCCACACAGTTGTTACTG
                *  ** **** ** ****** * ** ***** ************** *****  * ****
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Figure 196AH

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14CSR          CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG
670            CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG
6BF            CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG
6BSP           CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG
19AH           CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG
23FPO          CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG
19FTW          CTCACAGAGGATTGCCAACGGCAGAATTGTTCAGTCAATTGGATAAGATGAAGAAAGGGG
9VSP           CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG
TIGR4          CTCACAGAGGATTGCCAACGGCAGAATTGTTCAGTCAATTGGATAAGATGAAAAAAGGGG
23FTW          CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG
               **** ******** ** ********* **** ******************** *******

14CSR          ATGTCTTTTATCTTCACGTTTTAGACCAGGTGTTGGCCTACCAAGTGGATCAGATTTTGA
670            ATGTCTTTTATCTTCACGTTTTAGACCAGGTGTTGGCCTACCAAGTGGATCAGATTTTGA
6BF            ATGTCTTTTATCTTCACGTTTTAGACCAGGTGTTGGCCTACCAAGTGGATCAGATTTTGA
6BSP           ATGTCTTTTATCTTCACGTTTTAGACCAGGTGTTGGCCTACCAAGTGGATCAGATTTTGA
19AH           ATGTCTTTTATCTTCACGTTTTAGACCAGGTGTTGGCCTACCAAGTGGATCAGATTTTGA
23FPO          ATATCTTTTATCTTCACGTTTTAGATCAGGTGTTGGCCTACCAAGTGGATCAGATAGTGA
19FTW          ATATCTTTTATCTTCACGTTTTAGACCAGGTTTTGGCCTATCAAGTGGATCAGATAGTGA
9VSP           ATATCTTTTATCTTCACGTTTTAGATCAGGTGTTGGCCTACCAAGTGGATCAGATAGTGA
TIGR4          ATATCTTTTATCTTCACGTTTTAGATCAGGTGTTGGCCTACCAAGTGGATCAGATAGTGA
23FTW          ATGTCTTTTATCTTCACGTTTTAGACCAGGTGTTGGCCTACCAAGTGGATCAGATTTTGA
               ** ********************** ***** ******** **************  ***

14CSR          CGGTTGAGCCAAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT
670            CGGTTGAGCCAAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT
6BF            CGGTTGAGCCAAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT
6BSP           CGGTTGAGCCAAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT
19AH           CGGTTGAGCCAAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT
23FPO          CGGTGGAGCCGAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT
19FTW          CGGTGGAGCCGAATGATTTTGAGCCTGTTCTGATTCAACATGGACAAGATTATGCGACTT
9VSP           CGGTGGAGCCGAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT
TIGR4          CGGTGGAGCCGAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT
23FTW          CGGTTGAGCCAAATGACTTTGAGCCTGTCTTGATTCAACATGGGAAAGATTATGCGACCT
               **** ***** ***** ***********  *************  ************* *

14CSR          TGTTGACCTGTACACCGTATATGATTAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA
670            TGTTGACCTGTACACCGTATATGATTAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA
6BF            TGTTGACCTGTACACCGTATATGATTAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA
6BSP           TGTTGACCTGTACACCGTATATGATTAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA
19AH           TGTTGACCTGTACACCGTATATGATTAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA
23FPO          TGTTGACTTGTACACCGTATATGATTAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA
19FTW          TACTGACTTGTACGCCATACATGATTAACAGCCACCGTTTGTTGGTACGTGGGAAACGGA
9VSP           TGTTGACTTGTACACCGTATATGATTAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA
TIGR4          TGTTGACTTGTACACCGTATATGATTAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA
23FTW          TGTTGACCTGTACACCGTATATGATTAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA
               *  **** ***** ** ** *********** ** *** **************** ****

14CSR          TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT
670            TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT
6BF            TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT
6BSP           TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT
19AH           TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT
23FPO          TTCCGTATACGGCACCAATTGCAGAGCGGAATCGAGCGGTGAGAGAGCGTGGGCAATTCT
19FTW          TTCCATATACAGCGCCGATTGCTGAGCGGAATCGAGCGGTGAGAGAGCGTGGGCAATTCT
9VSP           TTCCGTATACGGCACCAATTGCAGAGCGGAATCGAGCGGTGAGAGAGCGTGGGCAATTCT
TIGR4          TTCCGTATACGGCACCAATTGCAGAGCGGAATCGAGCGGTGAGAGAGCGTGGGCAATTCT
23FTW          TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT
               **** ***** ** ** ***** ***** *******************************
```

Figure 196I

```
14CSR               GGTTGTGGTTATTGCTAGCGGCGTTGGTTATGATTCTGGTATTGAGTTACGGGGTGTATC
670                 GGTTGTGGTTATTGCTAGCGGCGTTGGTTATGATTCTGGTATTGAGTTACGGGGTGTATC
6BF                 GGTTGTGGTTATTGCTAGCGGCGTTGGTTATGATTCTGGTATTGAGTTACGGGGTGTATC
6BSP                GGTTGTGGTTATTGCTAGCGGCGTTGGTTATGATTCTGGTATTGAGTTACGGGGTGTATC
19AH                GGTTGTGGTTATTGCTAGCGGCGTTGGTTATGATTCTGGTATTGAGTTACGGGGTGTATC
23FPO               GGTTGTGGTTATTACTAGGAGCGATGGCGGTCATCCTTCTCTTGCTGTATCGCGTGTATC
19FTW               GGTTGTGGTTATTACTAGGAGCGATGGCGGTCATCCTTCTCTTGCTGTATCGCGTGTATC
9VSP                GGTTGTGGTTATTACTAGGAGCGATGGCGGTCATCCTTCTCTTGCTGTATCGCGTGTATC
TIGR4               GGTTGTGGTTATTACTAGGAGCGATGGCGGTCATCCTTCTCTTGCTGTATCGCGTGTATC
23FTW               GGTTGTGGTTATTGCTAGCGGCGTTGGTTATGATTCTGGTATTGAGTTACGGGGTGTATC
                    ************* ****  *** ***   * ** **  * ***   **  * *******

14CSR               GTCATCGTCGCATTGTCAAAGGGCTAGAAAAACAATTGGAGGAGCATCATGTCAAAGGCT
670                 GTCATCGTCGCATTGTCAAAGGGCTAGAAAAACAATTGGAGGAGCATCATGTCAAAGGCT
6BF                 GTCATCGTCGCATTGTCAAAGGGCTAGAAAAACAATTGGAGGAGCATCATGTCAAAGGCT
6BSP                GTCATCGTCGCATTGTCAAAGGGCTAGAAAAACAATTGGAGGAGCATCATGTCAAAGGCT
19AH                GTCATCGTCGCATTGTCAAAGGGCTAGAAAAACAATTGGAGGAGCATCATGTCAAAGGCT
23FPO               GTAATCGACGGATTGTCAAAGGACTAGAAAAGCAATTGGAGGGGCGTCATGTCAAGGACT
19FTW               GTAATCGACGGATTGTCAAAGGACTAGAAAAGCAATTGGAGGGGCGTCATGTCAAGGACT
9VSP                GTAATCGACGGATTGTCAAAGGACTAGAAAAGCAATTGGAGGGGCGTCATGTCAAGGACT
TIGR4               GTAATCGACGGATTGTCAAAGGACTAGAAAAGCAATTGGAGGGGCGTCATGTCAAGGACT
23FTW               GTCATCGTCGCATTGTCAAAGGGCTAGAAAAACAATTGGAGGAGCATCATGTCAAAGGCT
                    ** **** ** *********** ******** ********** ** ********* * **

14CSR               AAGCTACAGAAATTACTAGGGTATTTGCTGATGCTGGTAGCATTGGTGATTCCTGTTTAT
670                 AAGCTACAGAAATTACTAGGGTATTTGCTGATGCTGGTAGCATTGGTGATTCCTGTTTAT
6BF                 AAGCTACAGAAATTACTAGGGTATTTGCTGATGCTGGTAGCATTGGTGATTCCTGTTTAT
6BSP                AAGCTACAGAAATTACTAGGGTATTTGCTGATGCTGGTAGCATTGGTGATTCCTGTTTAT
19AH                AAGCTACAGAAATTACTAGGGTATTTGCTGATGCTGGTAGCATTGGTGATTCCTGTTTAT
23FPO               AAACTACGAGCCTTATTGGGATACTTGTTGATGTTGGTAGCCTGTTTGATTCCTATTTAT
19FTW               AAACTACGAGCCTTATTGGGATACTTGTTGATGTTGGTAGCCTGTTTGATTCCTATTTAT
9VSP                AAACTACGAGCCTTATTGGGATACTTGTTGATGTTGGTAGCCTGTTTGATTCCTATTTAT
TIGR4               AAACTACGAGCCTTATTGGGATACTTGTTGATGTTGGTAGCCTGTTTGATTCCTATTTAT
23FTW               AAGCTACAGAAATTACTAGGGTATTTGCTGATGCTGGTAGCATTGGTGATTCCTGTTTAT
                    ** ****     *** * ** ** *** ***** ******* *   ******** *****

14CSR               TGTTTTGGGCAGATGGTGTTACAGTCTTTAGGACAAGTAAAAGGTCATGAGATATTTTCA
670                 TGTTTTGGGCAGATGGTGTTACAGTCTTTAGGACAAGTAAAAGGTCATGAGATATTTTCA
6BF                 TGTTTTGGGCAGATGGTGTTACAGTCTTTAGGACAAGTAAAAGGTCATGAGATATTTTCA
6BSP                TGTTTTGGGCAGATGGTGTTACAGTCTTTAGGACAAGTAAAAGGTCATGAGATATTTTCA
19AH                TGTTTTGGGCAGATGGTGTTACAGTCTTTAGGACAAGTAAAAGGTCATGAGATATTTTCA
23FPO               TGTTTTGGACAGATGGTGTTGCAGTCTCTTGGACAGGTGAAAGGTCATGCTACATTTGTG
19FTW               TGTTTTGGACAGATGGTGTTGCAGTCTCTTGGACAGGTGAAAGGTCATGCTACATTTGTG
9VSP                TGTTTTGGACAGATGGTGTTGCAGTCTCTTGGACAGGTGAAAGGTCATGCTACATTTGTG
TIGR4               TGTTTTGGACAGATGGTGTTGCAGTCTCTTGGACAGGTGAAAGGTCATGCTACATTTGTG
23FTW               TGTTTTGGGCAGATGGTGTTACAGTCTTTAGGACAAGTAAAAGGTCATGAGATATTTTCA
                    ******** *********** ****** * ***** ** **********  * ****

14CSR               GAATCTGTGACGGCCGACAGTTACCAAGAGCAATTGCAACGGTCGCTTGATTACAATCAA
670                 GAATCTGTGACGGCCGACAGTTACCAAGAGCAATTGCAACGGTCGCTTGATTACAATCAA
6BF                 GAATCTGTGACGGCCGACAGTTACCAAGAGCAATTGCAACGGTCGCTTGATTACAATCAA
6BSP                GAATCTGTGACGGCCGACAGTTACCAAGAGCAATTGCAACGGTCGCTTGATTACAATCAA
19AH                GAATCTGTGACGGCCGACAGTTACCAAGAGCAATTGCAACGGTCGCTTGATTACAATCAA
23FPO               AAATCCATGACAACTGAAATGTACCAAGAACAACAGAACCATTCTCTCGCCTACAATCAA
19FTW               AAATCCATGACAACTGAAATGTACCAAGAACAACAGAACCATTCTCTCGCCTACAATCAA
9VSP                AAATCCATGACAACTGAAATGTACCAAGAACAACAGAACCATTCTCTCGCCTACAATCAA
TIGR4               AAATCCATGACAACTGAAATGTACCAAGAACAACAGAACCATTCTCTCGCCTACAATCAA
23FTW               GAATCTGTGACGGCCGACAGTTACCAAGAGCAATTGCAACGGTCGCTTGATTACAATCAA
                     ****  ****  * ** *  ******** ***  * * *  ** ** *  *********
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Figure 196AJ

```
14CSR       CGCTTGGATTCGCAAAATCGTATTGTAGATCCTTTTTTGGCGGAAGGGTATGAGGTAAAT
670         CGCTTGGATTCGCAAAATCGTATTGTAGATCCTTTTTTGGCGGAAGGGTATGAGGTAAAT
6BF         CGCTTGGATTCGCAAAATCGTATTGTAGATCCTTTTTTGGCGGAAGGGTATGAGGTAAAT
6BSP        CGCTTGGATTCGCAAAATCGTATTGTAGATCCTTTTTTGGCGGAAGGGTATGAGGTAAAT
19AH        CGCTTGGATTCGCAAAATCGTATTGTAGATCCTTTTTTGGCGGAAGGGTATGAGGTAAAT
23FPO       CGCTTGGCTTCGCAAAATCGCATTGTAGATCCTTTTTTGGCGGAGGGATATGAGGTCAAT
19FTW       CGCTTGGCTTCGCAAAATCGCATTGTAGATCCTTTTTTGGCGGAGGGATATGAGGTCAAT
9VSP        CGCTTGGCTTCGCAAAATCGCATTGTAGATCCTTTTTTGGCGGAGGGATATGAGGTCAAT
TIGR4       CGCTTGGCTTCGCAAAATCGCATTGTAGATCCTTTTTTGGCGGAGGGATATGAGGTCAAT
23FTW       CGCTTGGATTCGCAAAATCGTATTGTAGATCCTTTTTTGGCGGAAGGGTATGAGGTAAAT
            ******* ************ *********************** ** ******** ***

14CSR       TACCAAGTGTCTGACGATCCTGATGCAGTCTACGGCTATTTGTCGATTCCGAGTTTGGAA
670         TACCAAGTGTCTGACGATCCTGATGCAGTCTACGGCTATTTGTCGATTCCGAGTTTGGAA
6BF         TACCAAGTGTCTGACGATCCTGATGCAGTCTACGGCTATTTGTCGATTCCGAGTTTGGAA
6BSP        TACCAAGTGTCTGACGATCCTGATGCAGTCTACGGCTATTTGTCGATTCCGAGTTTGGAA
19AH        TACCAAGTGTCTGACGATCCTGATGCAGTCTACGGCTATTTGTCGATTCCGAGTTTGGAA
23FPO       TACCAAGTGTCTGACGACCCTGATGCAGTCTATGGTTACTTGTCTATTCCAAGTTTGGAA
19FTW       TACCAAGTGTCTGACGACCCTGATGCAGTCTATGGTTACTTGTCTATTCCAAGTTTGGAA
9VSP        TACCAAGTGTCTGACGACCCTGATGCAGTCTATGGTTACTTGTCTATTCCAAGTTTGGAA
TIGR4       TACCAAGTGTCTGACGACCCTGATGCAGTCTATGGTTACTTGTCTATTCCAAGTTTGGAA
23FTW       TACCAAGTGTCTGACGATCCTGATGCAGTCTACGGCTATTTGTCGATTCCGAGTTTGGAA
            ***************** ************** ** ** ***** ***** *********

14CSR       ATCATGGAGCCAGTTTATCTAGGAGCGGATTACCATCATTTAGCAATGGGGTTGGCCCAT
670         ATCATGGAGCCAGTTTATCTAGGAGCGGATTACCATCATTTAGCAATGGGGTTGGCCCAT
6BF         ATCATGGAGCCAGTTTATCTAGGAGCGGATTACCATCATTTAGCAATGGGGTTGGCCCAT
6BSP        ATCATGGAGCCAGTTTATCTAGGAGCGGATTACCATCATTTAGCAATGGGGTTGGCCCAT
19AH        ATCATGGAGCCAGTTTATCTAGGAGCGGATTACCATCATTTAGCAATGGGGTTGGCCCAT
23FPO       ATCATGGAGCCGGTTTATTTGGGAGCAGATTATCATCATTTAGGGATGGGCTTGGCTCAT
19FTW       ATCATGGAGCCGGTTTATTTGGGAGCAGATTATCATCATTTAGGGATGGGCTTGGCTCAT
9VSP        ATCATGGAGCCGGTTTATTTGGGAGCAGATTATCATCATTTAGGGATGGGCTTGGCTCAT
TIGR4       ATCATGGAGCCGGTTTATTTGGGAGCAGATTATCATCATTTAGGGATGGGCTTGGCTCAT
23FTW       ATCATGGAGCCAGTTTATCTAGGAGCGGATTACCATCATTTAGCAATGGGGTTGGCCCAT
            *********** ****** * ***** ***** **********  ***** ***** ***

14CSR       GTGGATGGGACGCCTCTTCCTGTTGAGGGAAAAGGGATTCGTTCAGTGATTGCTGGGCAC
670         GTGGATGGGACGCCTCTTCCTGTTGAGGGAAAAGGGATTCGTTCAGTGATTGCTGGGCAC
6BF         GTGGATGGGACGCCTCTTCCTGTTGAGGGAAAAGGGATTCGTTCAGTGATTGCTGGGCAC
6BSP        GTGGATGGGACGCCTCTTCCTGTTGAGGGAAAAGGGATTCGTTCAGTGATTGCTGGGCAC
19AH        GTGGATGGGACGCCTCTTCCTGTTGAGGGAAAAGGGATTCGTTCAGTGATTGCTGGGCAC
23FPO       GTGGATGGTACACCGCTGCCTCTGGATGGTACAGGGATTCGCTCAGTGATTGCTGGGCAC
19FTW       GTGGATGGTACACCGCTGCCTCTGGATGGTACAGGGATTCGCTCAGTGATTGCTGGGCAC
9VSP        GTGGATGGTACACCGCTGCCTCTGGATGGTACAGGGATTCGCTCAGTGATTGCTGGGCAC
TIGR4       GTGGATGGTACACCGCTGCCTCTGGATGGTACAGGGATTCGCTCAGTGATTGCTGGGCAC
23FTW       GTGGATGGGACGCCTCTTCCTGTTGAGGGAAAAGGGATTCGTTCAGTGATTGCTGGGCAC
            ******** ** ** ** *** * ** ** * ********* ******************

14CSR       CGTGCAGAACCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
670         CGTGCAGAACCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
6BF         CGTGCAGAACCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
6BSP        CGTGCAGAACCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
19AH        CGTGCAGAACCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
23FPO       CGTGCAGAGCCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
19FTW       CGTGCAGAGCCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
9VSP        CGTGCAGAGCCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
TIGR4       CGTGCAGAGCCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
23FTW       CGTGCAGAACCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
            ******** ***************************************************
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Figure 196AK

```
14CSR          CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT
670            CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT
6BF            CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT
6BSP           CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT
19AH           CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT
23FPO          CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT
19FTW          CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT
9VSP           CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT
TIGR4          CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT
23FTW          CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT
               ************************************************************

14CSR          TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA
670            TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA
6BF            TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA
6BSP           TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA
19AH           TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA
23FPO          TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA
19FTW          TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA
9VSP           TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA
TIGR4          TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA
23FTW          TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA
               ************************************************************

14CSR          ACCTGCGATCCGATTCCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT
670            ACCTGCGATCCGATTCCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT
6BF            ACCTGCGATCCGATTCCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT
6BSP           ACCTGCGATCCGATTCCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT
19AH           ACCTGCGATCCGATTCCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT
23FPO          ACCTGCGATCCGATTCCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT
19FTW          ACCTGCGATCCGATTCCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT
9VSP           ACCTGCGATCCGATTCCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT
TIGR4          ACCTGCGATCCGATTCCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT
23FTW          ACCTGCGATCCGATTCCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT
               ************************************************************

14CSR          GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA
670            GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA
6BF            GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA
6BSP           GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA
19AH           GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA
23FPO          GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA
19FTW          GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA
9VSP           GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA
TIGR4          GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA
23FTW          GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA
               ************************************************************

14CSR          GGACAATCTGTATCGCGTGTTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG
670            GGACAATCTGTATCGCGTGTTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG
6BF            GGACAATCTGTATCGCGTGTTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG
6BSP           GGACAATCTGTATCGCGTGTTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG
19AH           GGACAATCTGTATCGCGTGTTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG
23FPO          GGACAATCTGTATCGCGTGTTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG
19FTW          GGACAATCTGTATCGCGTGTTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG
9VSP           GGACAATCTGTATCGCGTGTTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG
TIGR4          GGACAATCTGTATCGCGTGTTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG
23FTW          GGACAATCTGTATCGCGTGTTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG
               ************************************************************
```

Figure 196AL

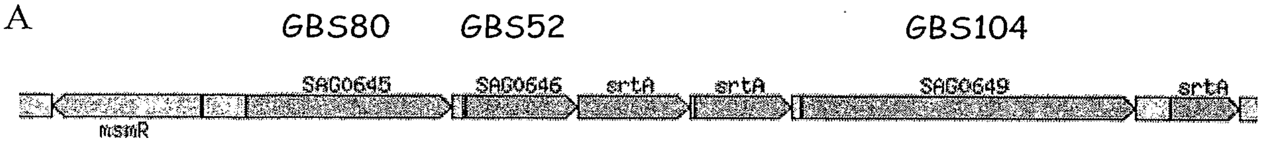
```
14CSR          GCATTTCTGGGAATCCTGTTTGTTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
670            GCATTTCTGGGAATCCTGTTTGTTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
6BF            GCATTTCTGGGAATCCTGTTTGTTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
6BSP           GCATTTCTGGGAATCCTGTTTGTTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
19AH           GCATTTATGGGAATCCTGTTTGTTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
23FPO          GCATTTCTGGGAATCCTGTTTGTTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
19FTW          GCATTTCTGGGAATCCTGTTTGTTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
9VSP           GCATTTCTGGGAATCCTGTTTGTTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
TIGR4          GCATTTCTGGGAATCCTGTTTGTTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
23FTW          GCATTTCTGGGAATCCTGTTTGTTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
               ****** *****************************************************

14CSR          AAAGAAATGAAAGGAAAGCTAAGGCTGTTCCTTTTTCCGGCTCTTTGTCAACTGTAGGGG
670            AAAGAAATGAAAGGAAAGCTAAGGCTGTTCCTTTTTCCGGCTCTTTGTCAACTGTAGTGG
6BF            AAAGAAATGAAAGGAAAGCTAAGGCTGTTCCTTTTTCCGGCTCTTTGTCAACTGTAG---
6BSP           AAAGAAATGAAAGGAAAGCTAAGGCTGTTCCTTTTTCCGGCTCTTTGTCAACTGTAG---
19AH           AAAGAAATGAAAGGAAAGCTAAGGCTGTTCCTTTTTCCGGCTCTTTGTCAACTGTAG---
23FPO          AAAGAAATGAAAGGAAAGCTAAGGCTGTTCCTTTTTCCGGCTCTTTGTCAACTGT-----
19FTW          AAAGAAATGAAAGGAAAGCTAAGGCTGTTCCTTTTTCCGGCTCTTTGTCAACTGTAGT--
9VSP           AAAGAAATGAAAGGAAAGCTAAGGCTGTTCCTTTTTCCGGCTCTTTGTCAACTGTAG---
TIGR4          AAAGAAATGAAAGGAAAGCTAAGGCTGTTCCTTTTTCCGGCTCTTTGTCAACTGTAGTGG
23FTW          AAAGAAATGAAAGGAAAGCTAAGGCTGTTCCTTTTTCCGGCTCTTTGTCAACTGTA----
               *******************************************************
```

Figure 196AM

Figure 197

A



B

Intergenic region between AraC R and GBS 80

AraC..CAT

TTGATAGA**CCGCCTTC**ATTATCATTTCTAGAATTTTTCTTTAGGTTTGTA
AAGACTACAAAATAAAATGATGAAAACAACTATCTTGTGGATACACTAAA
AAGACACGCTAATTAGCAAACTCTCTCTTCATCATCTCTCACCATTATTA
TACTAC***TATTTATAT***GACAAATAAAGGT**G**ATTT***TGTTAA***AATATAACTTT
GAAAATCCACATATATTTTTAATCTTCCGTCTG**AAAAAA**TAAATAAAAAT
AGTAAAAATAAACACGAATTTAAAATAAGCAAATTTTTTAAGAAAATCTG
TGCTAAACTTTAATAGTTTTGTGCTTAATAATAATCAGCACTTACAAAGA
ACAAAGGGAAAAGCGA**GGAGA**GAACTTTTA **ATG.. GBS80**

C

187	4A		5A		5A
233	6A		6A		7A
Strain	FACS a -80	Strain	FACS a -80	Strain	FACS a -80
1998	95	5364	**454**	2129	57
2110	0	JMV071	**556**	2274	113
2603	62	JM91003	**587**	5401	170
3050	43	CJB111	**365**	5408	0
5376	165			5518	31
M781	65			CJB110	71
COH1	**305** (G->T 179)			J7357B	91
18rs 21	0 (STOP, no LPXTG)			COH31	0

AI-1											
			aa	M1	M3	M5	M18	M49	M6	M12	
M6											
50913503	M6_Spy0157	LPXTG	628	gas15 30%in593aa	M3-0098 46%in256aa M3-0104 28%in563aa		M18-0132 24%in701aa			M12-4134 74%in703aa	Fibronectin-binding protein (protein F)
50913505	M6_Spy0159	LPXSG	1037		M3-0104 25%in339aa					M12-4141 37%in98aa	Collagen adhesion protein
50913506	M6_Spy0160	LPXTG	557								Fimbrial structural subunit

Figure 198

AI-2											
			aa	M1	M3	M5	M18	M49	M6	M12	
M1											
gas15	gas15	VVXTG	762		M3-0098 50%in738aa	M5-orf78 60%in462aa	M18-0126 54%in469aa			M12-4135 54%in747aa	Cpa
13621428	SPy0128 gas16	EVXTG	340		M3-0100 40%in354aa	M5-orf80 41%in358aa	M18-0128 38%in357aa			M12-4137 40%in354aa	hypothetical protein (fimbrial)
13621430	SPy0130 gas18	LPXTG	215		M3-0102 32%200aa	M5-orf82 31%in213aa	M18-0130 32%in213aa			M12-4139 31%in206aa	hypothetical protein

Figure 199

AI-3											
			aa	M1	M3	M5	M18	M49	M6	M12	
M3											
21909634	SpyM3_0098	VPXTG	744	gas15 51%in739aa		M5-orf78 58%in484aa	M18-0126 74%in482aa			M12-4135 55%in751aa	putative collagen binding protein (Cpb)
21909636	SpyM3_0100	QVXTG	344	gas16 40%in354aa		M5-orf80 64%in349aa	M18-0128 67%in345aa			M12-4137 61%in344aa	conserved hypothetical protein (fimbrial)
21909638	SpyM3_0102	LPXAG	195	gas18 32%in200aa		M5-orf82 98%in183aa	M18-0130 97%in183aa			M12-4139 99%in183aa	hypothetical protein
21909640	SpyM3_0104	LPXTG	696			M5-orf84 88%in656aa	M18-0132 88%in656aa			M12-4141 59%in612aa	protein F2 like fibronectin -binding

Figure 200A

M18											
19745301	spyM18_0126	VPXTG	524	gas15 54%in469aa	M3-0098 74%in482	M5-orf78 61%in528aa				M12-4135 59%in489aa	putative collagen binding protein (Cpb)
19745303	spyM18_0128	QVXTG	344	gas16 38%in357aa	M3-0100 67%in345aa	M5-orf80 60%in349aa				M12-4137 62%in344aa	conserved hypothetical protein (fimbrial)
19745305	spyM18_0130	LPXAG	195	gas18 32%in213aa	M3-0102 97%in189aa	M5-orf82 99%in195aa				M12-4139 97%in189aa	hypothetical protein
19745307	spyM18_0132	LPXTG	696		M3-0104 88%in656aa	M5-orf84 100%in696aa				M12-4141 50%in701aa	protein F2 like fibronectin -binding

Figure 200B

M5											
orf78		VPXTG	523	gas15 60%in462aa	M3-0098 58%in481aa		M18-0126 61%in528aa			M12-4135 80%in484aa	putative collagen binding protein (Cpb)
orf80		QVXTG	352	gas16 39%in356aa	M3-0100 64%in349aa		M18-0128 60%in349aa			M12-4137 65%in348aa	conserved hypothetical protein (fimbrial)
orf82		LPXAG	224	gas18 31%in213aa	M3-0102 98%in183aa		M18-0130 99%in195aa			M12-4139 98%in189aa	hypothetical protein
orf84		LPXTG	696		M3-104 88%in656aa		M18-0132 100%in696aa			M12-4141 50%in701aa	protein F2 like fibronectin -binding

Figure 200C

M49											
56808848		VPXTG	744	gas15 55%in738aa	M3-0098 72%in743aa	M5-orf78 78%in483	M18-0126 61% in484			M12-4135 73%in752aa	putative collagen binding protein (Cpb)
56808846		QVXTG	344	gas16 36%in355aa	M3-0100 66%in345aa	M5-orf80 61%in349aa	M18-0128 90%in344aa			M12-4137 62%in344aa	conserved hypothetical protein (fimbrial)
56808844		LPXAG	189	gas18 31%in206aa	M3-102 98%in189aa	M5-orf82 98%in189aa	M18-0130 98%in189aa			M12-4139 98%in189aa	hypothetical protein
56808842		LPXTG	1160		M3-104 59%in612aa	M5-orf84 50%in701aa	M18-0132 50%in701aa		M6-0157 32%in296aa	M12-4141 91%in1164aa	protein F2 like fibronectin-binding

Figure 200D

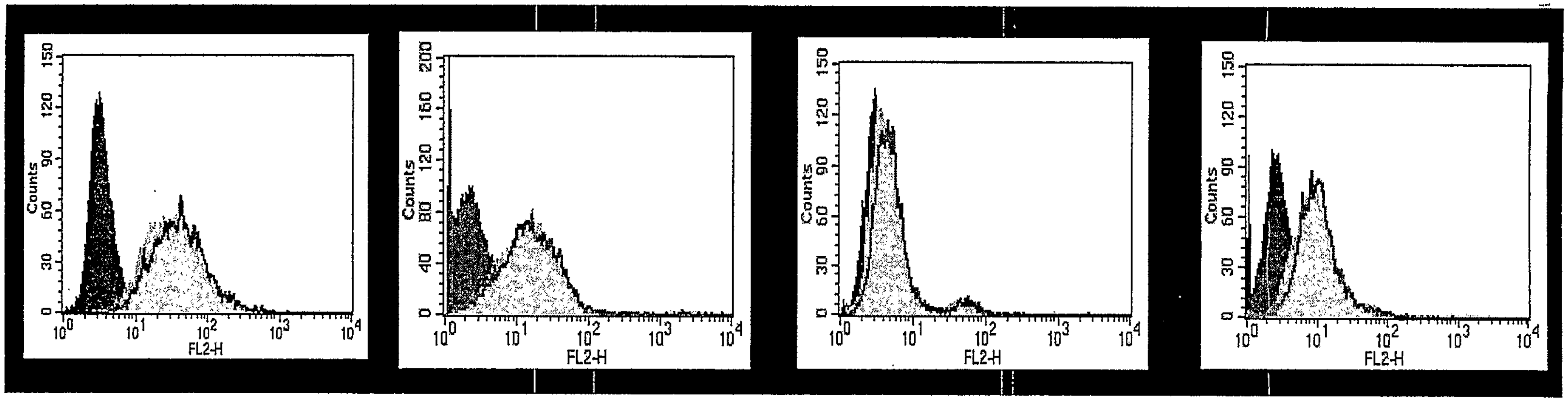
AI-4											
			aa	M1	M3	M5	M18	M49	M6	M12	
M12											
19224134		LPXTG	698	gas15 44%in297aa	M3-0098 49%in254aa				M6-0157 74%in703aa		protein F
19224135		VPXTG	756	gas15 54%in747aa	M3-0098 55%in751aa	orf78 80%in484aa	M18-0126 59%in483aa		M6-0157 51%in275aa		Cpa
19224137		QVXTG	342	gas16 40%in354aa	M3-0100 61%in344aa	orf80 65%in384aa	M18-0128 62%in344aa				EftLSLA (fimbrial)
19224139		LPXAG	189	gas18 31%in206aa	M3-0102 99%in183aa	orf82 98%in189aa	M18-130 97%in189aa				Orf2
19224141		LPXTG	1161		M3-0104 59%in612aa	orf84 50%in701aa	M18-0132 50%in701aa				protein F2

Figure 201

Figure 202

3S80 recombinant protein does not bind to epithelial c

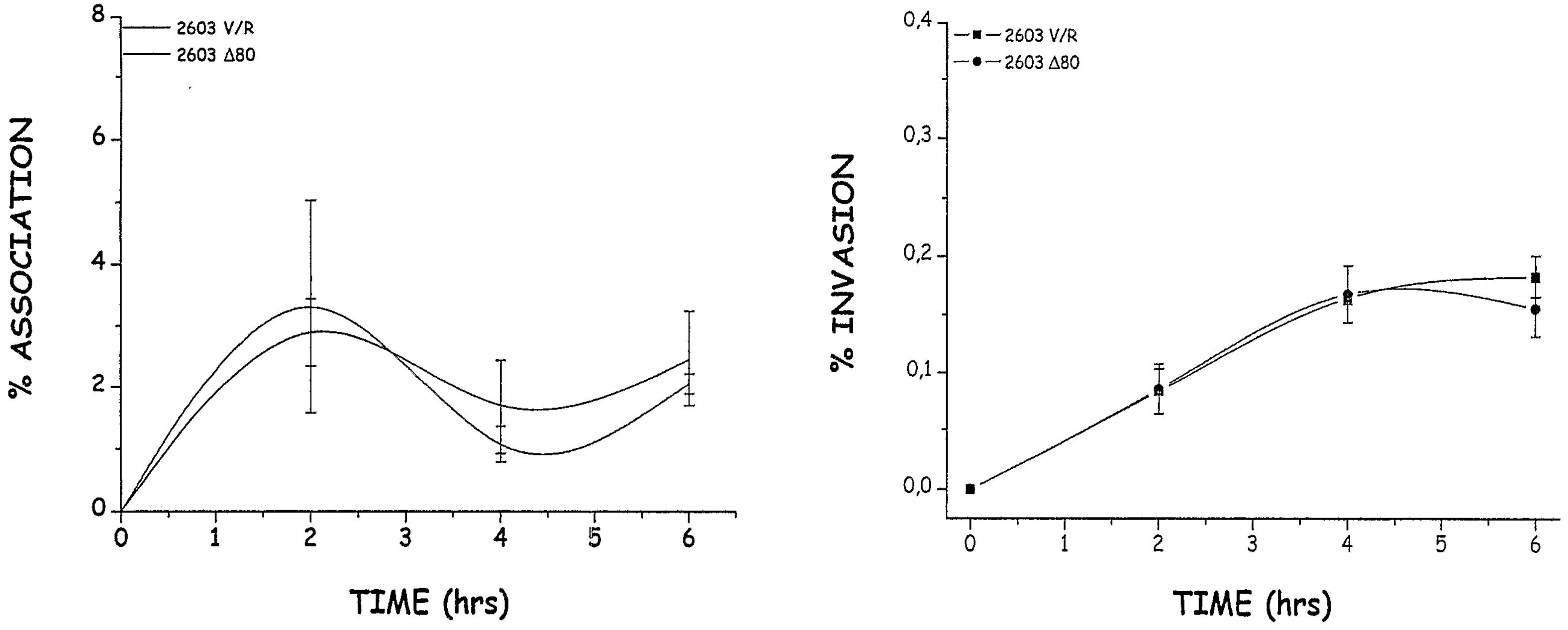
Name	ME180	16HBE	A549	Caco2
Origin	Cervical	Bronchial	Lung	Intestinal
Host	Human	Human	Human	Human



Epithelial cells were incubated in the presence or absence of GBS80 protein and then a mouse a-GBS80 polyclonal antibody added. The cell were then stained with FITC-conjugated a-mouse IgG antibody. The violet area indicates cells treated with FITC-conjugated antibody alone. GBS80 binding, expressed as Dmean channel values, was measured by FACScan cytometer as difference in fluorescence intensity between cell incubated with or without GBS80. The same protocol was used for GBS104 protein binding to epithelial cells

Figure 203

Deletion of GBS80 protein does not affect the ability of GBS to adhere and invade ME180



ME180 cervical carcinoma epithelial cells were infected with GBS 2603 wild type or 2603 D80 isogenic mutant. After 2h infection, non-adherent bacteria were washed off and infection prolonged for further 2h and 4h. In invasion experiments, after each time point followed a 2h antibiotic treatment. Cells were then lysed with 1% saponin and lysates plated on TSA plates.

Figure 204

GBS80 binds to ECM proteins

ELISA with purified ECM components and native GBS80 protein

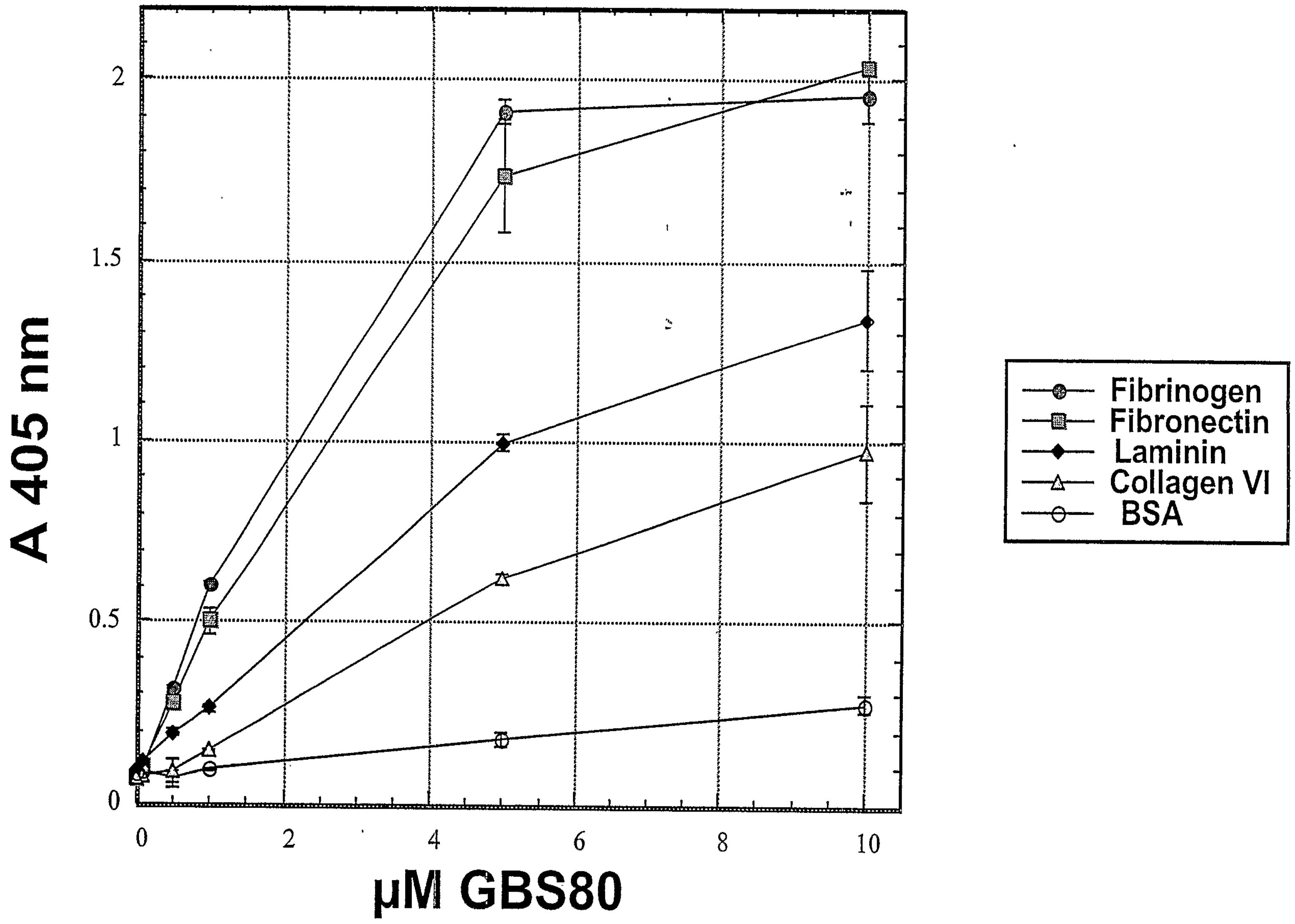
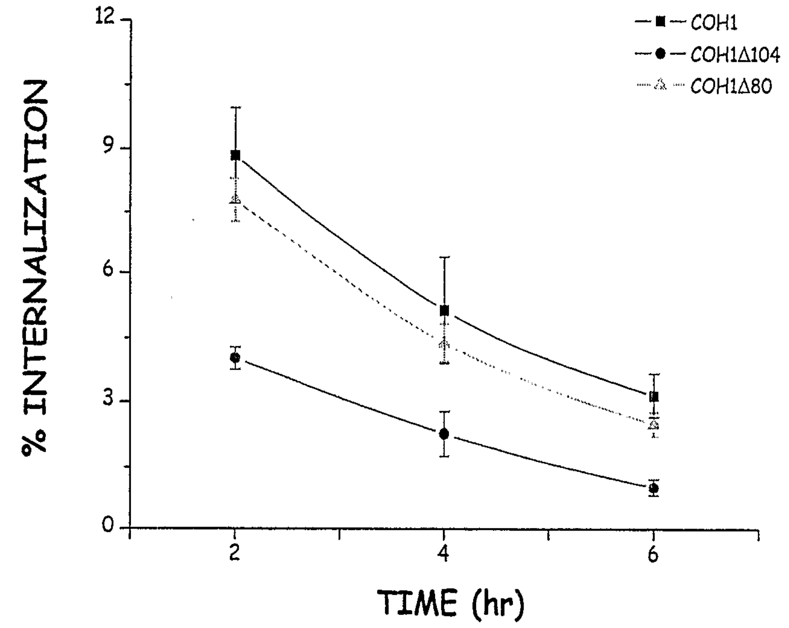


Figure 205

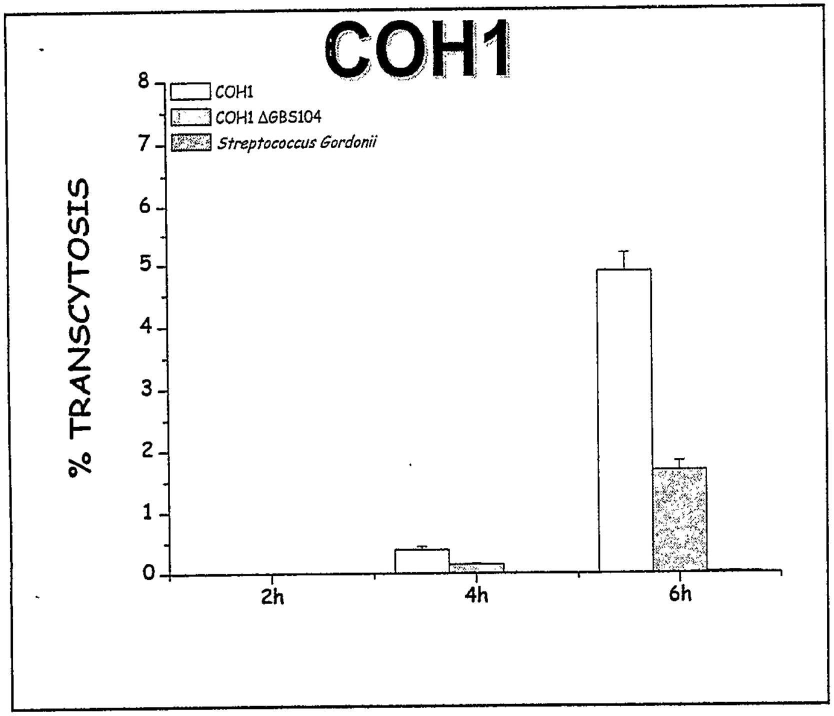
Deletion of GBS104 protein, but not GBS80, reduces the capacity of GBS to invade J774 macrophage-like cell line



J774 cells were infected with GBS COH1 wild type or COH1ΔGBS104/ COH1ΔGBS80 isogenic mutants. After 1h infection, non-adherent bacteria were washed off and intracellular bacteria recovered at 2h, 4h and 6h post-antibiotic treatment. At each time point cells were lysed with 0.25% Triton X-100 and

Figure 206

GBS104 knockout mutant strain translocates through an epithelial monolayer less efficiently than the isogenic wild type



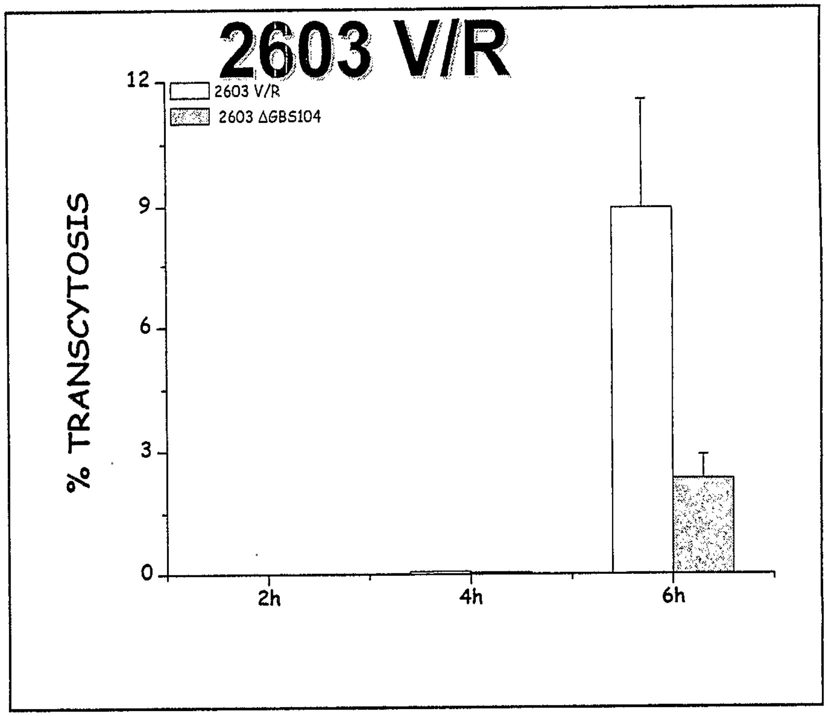
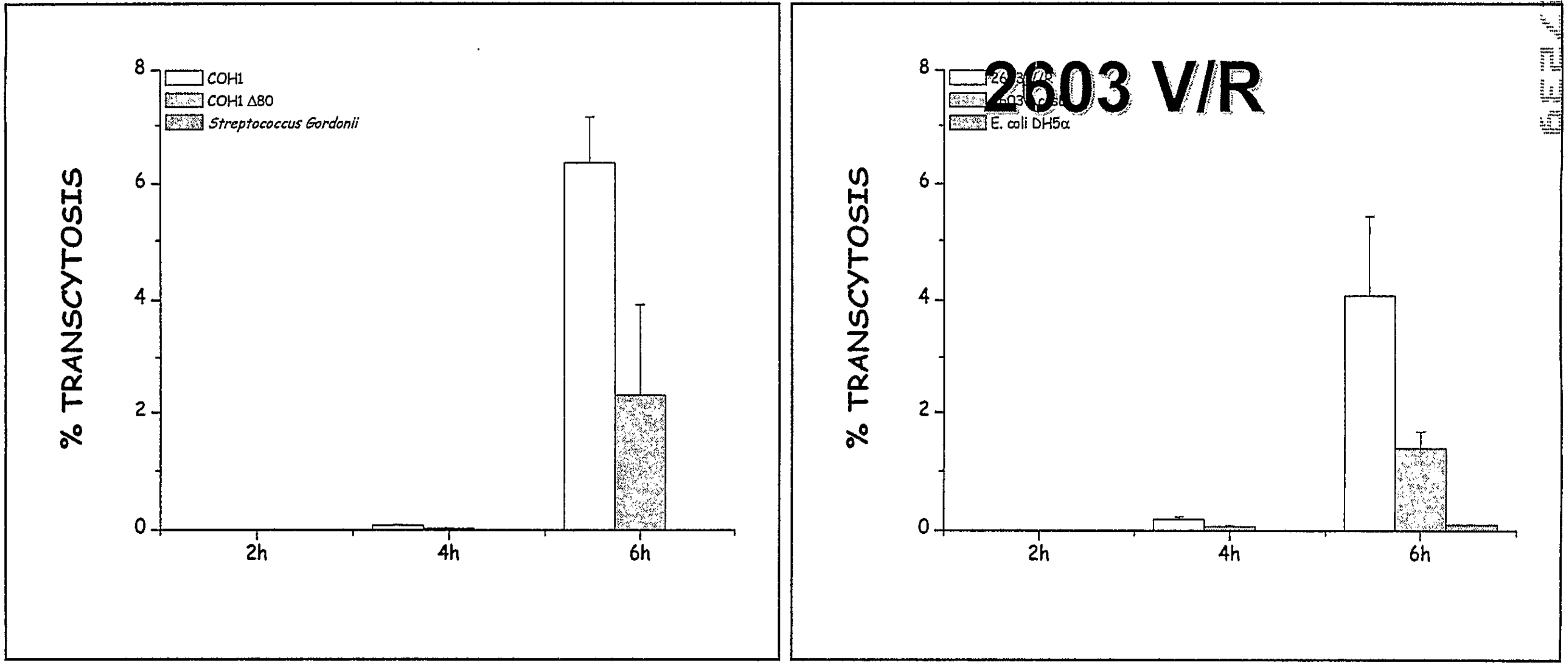


Figure 207

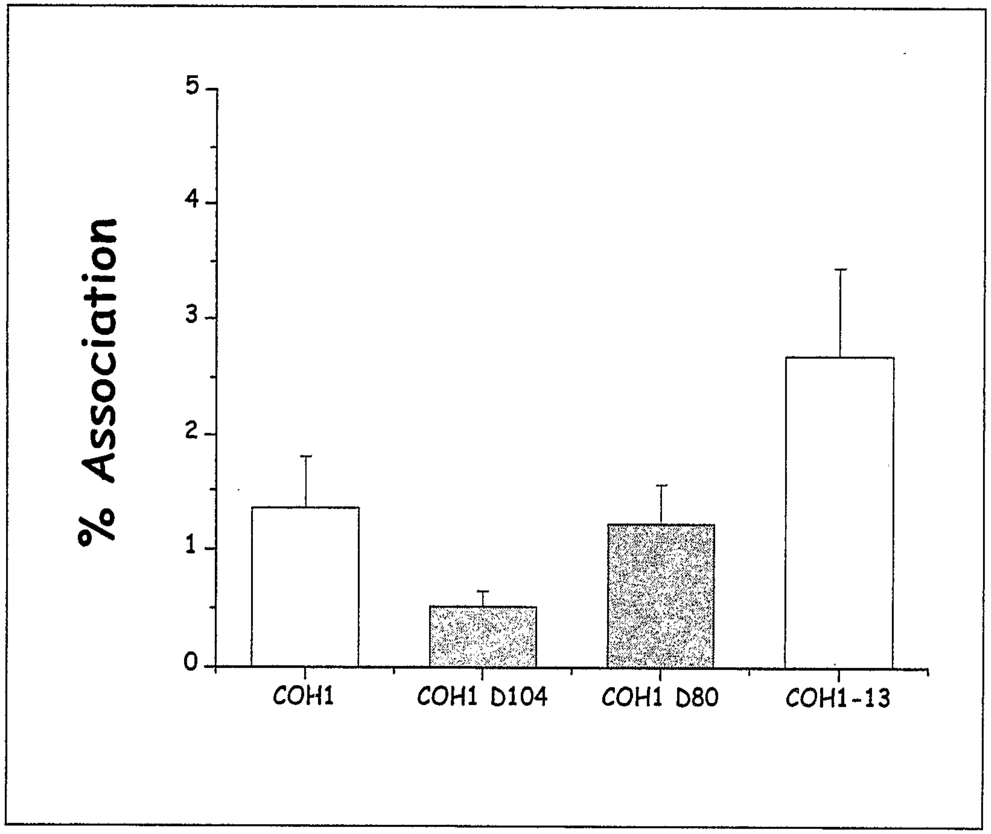
GBS80 knockout mutant strain partially loses the ability to translocate through an epithelial monolayer



Epithelial cells monolayers were inoculated with each bacterium in the apical chamber of a transwell system for 2h and then non-adherent bacteria washed off. Infection was prolonged for further 2h and 4h. Samples were taken from the media of the basolateral side and the number of colony forming units measured. Transepithelial electrical resistance measured prior and after infection gave comparable values, indicating the maintenance of the integrity of the monolayer.

Figure 208

GBS adherence to HUVEC endothelial cells



HUVEC cells were infected with GBS COH1 wild type or COH1DGBS104/ COH1DGBS80 isogenic mutants. After 1h infection, non-adherent bacteria were washed off and cells lysed with 1% saponin and lysates plated on TSA plates.

Figure 209

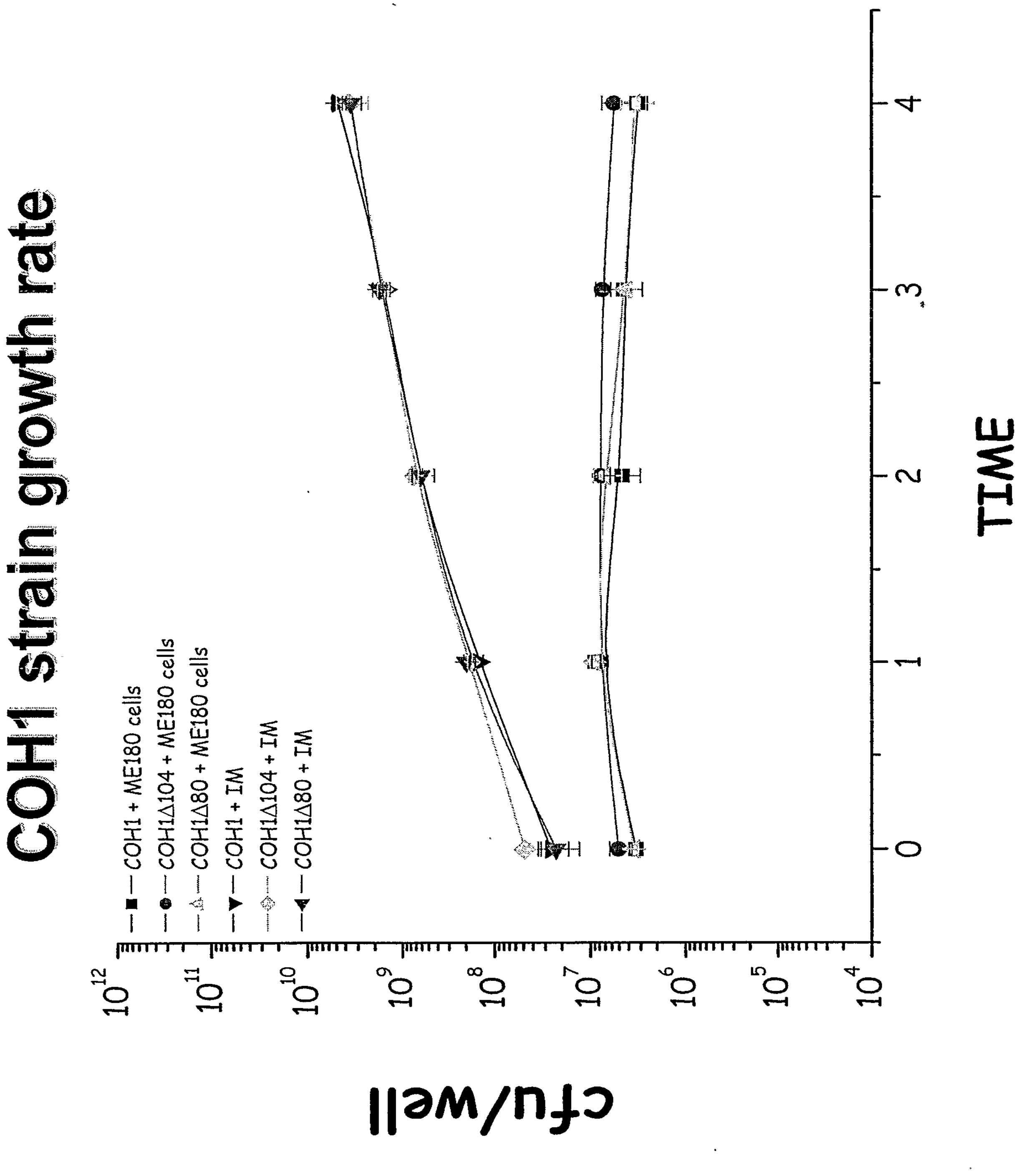

COH1 strain growth rate
COH1 + ME180 cells
COH1Δ104 + ME180 cells
COH1Δ80 + ME180 cells
COH1 + IM
COH1Δ104 + IM
COH1Δ80 + IM
cfu/well
10^{12}
10^{11}
10^{10}
10^{9}
10^{8}
10^{7}
10^{6}
10^{5}
10^{4}
0
1
2
3
4
TIME

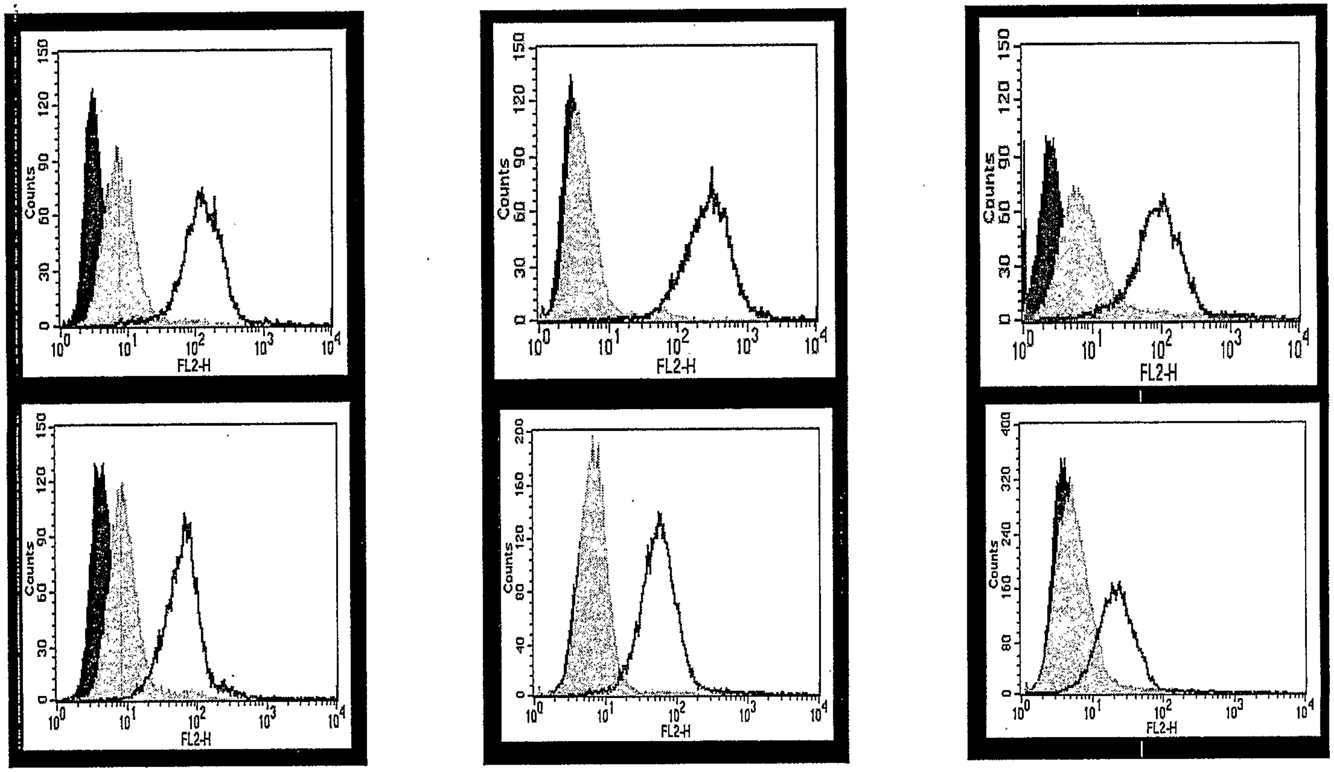
Figure 210

nding of recombinant GBS104 protein to epithelial ce

Name Origin Host	ME180 Cervical Human	A549 Lung Human	Caco2 Intestinal Human

Whole lenght protein 830 AA

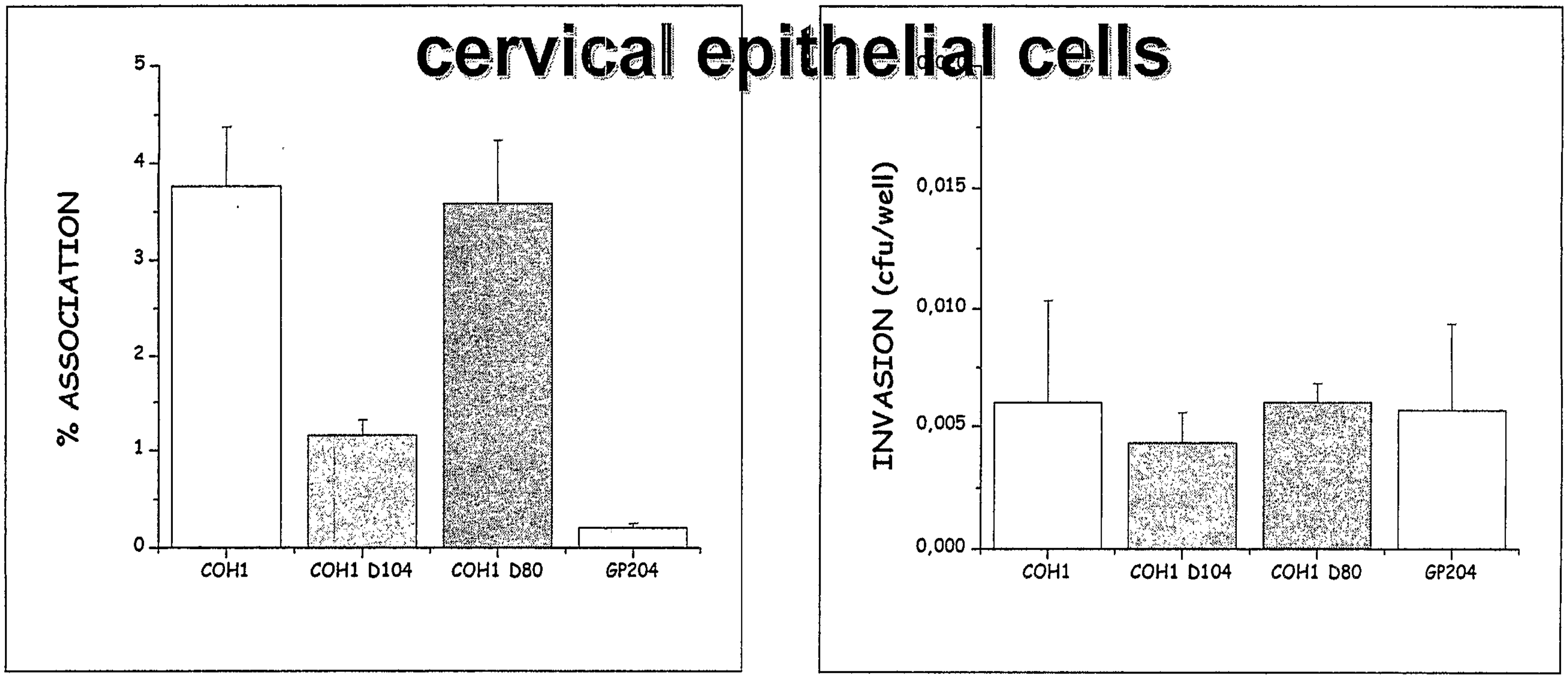
C-term portion 359 AA



449/487

Figure 211

Deletion of GBS104 protein in the GBS strain COH1 reduces the ability of GBS to adhere to ME180 cervical epithelial cells



ME180 cervical carcinoma epithelial cells were infected with GBS COH1 wild type or COH1DGBS104/ COH1DGBS80 isogenic mutants. After 1h infection, non-adherent bacteria were washed off and cells lysed with 1% saponin and lysates plated on TSA plates

Figure 212

COH1 overexpressing GBS80 protein has an impaired capacity to translocate through an epithelial monolayer

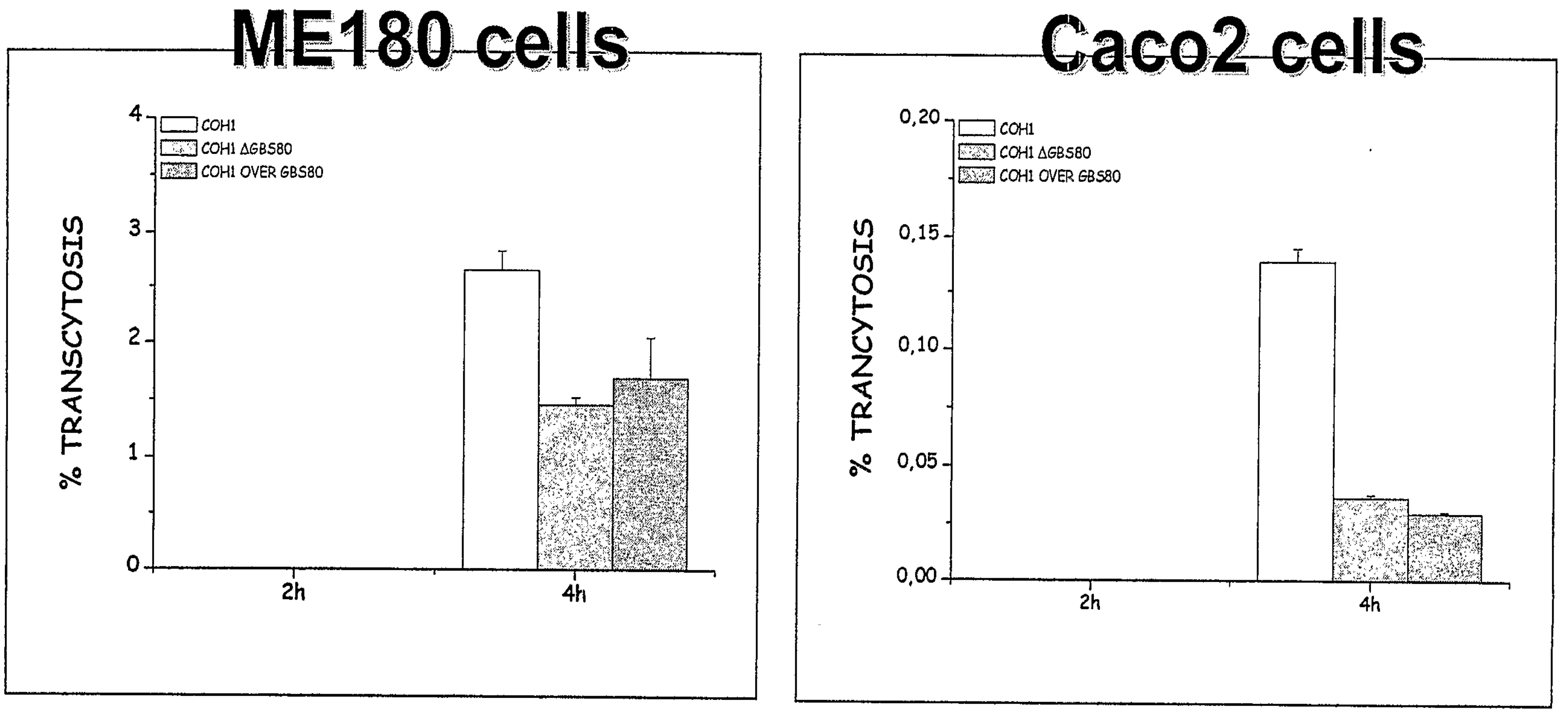
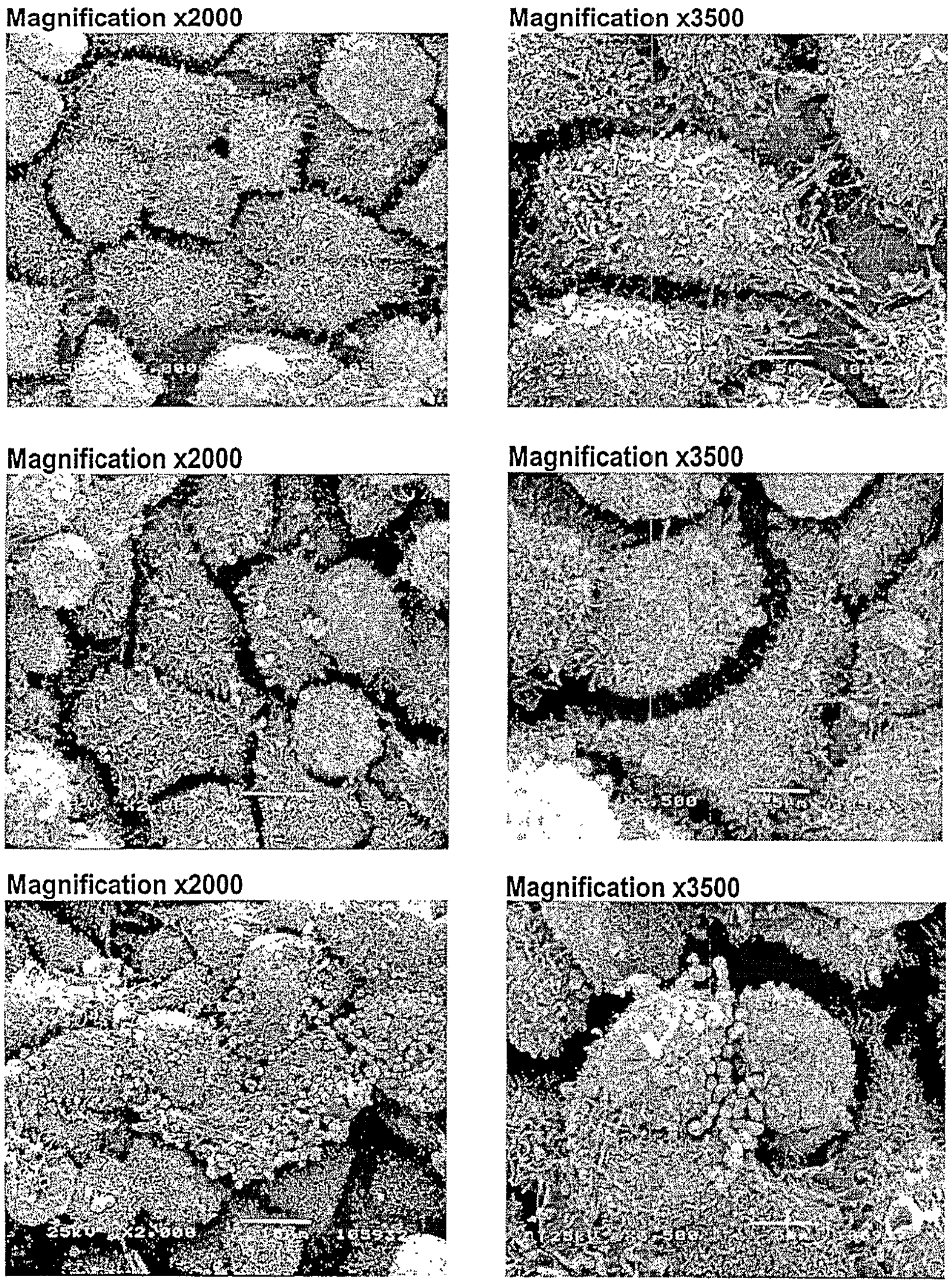


Figure 213



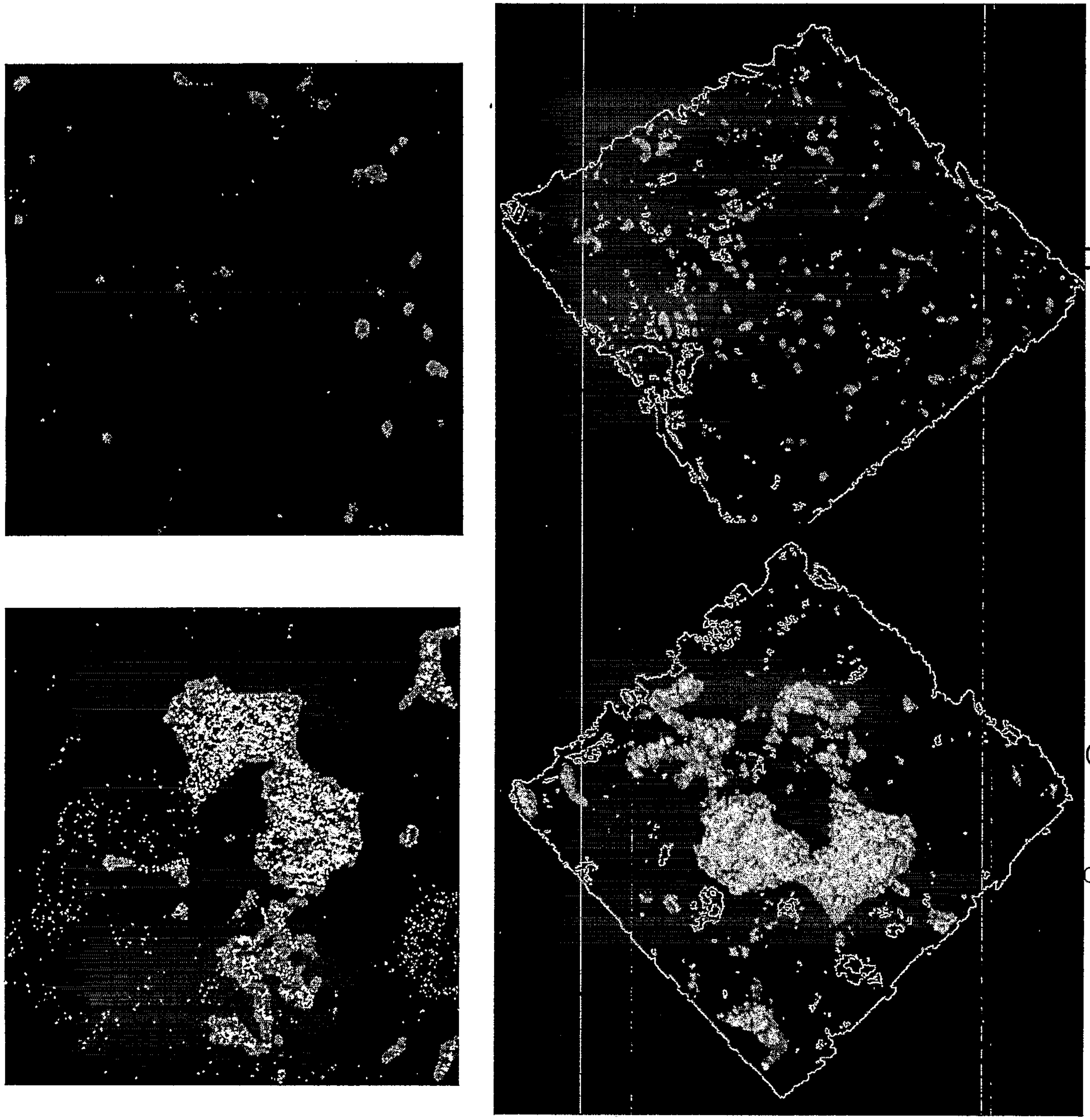
Non-infected ME180 cells (SEM)

ME180 cells infected with COH1 strain (SEM)

ME180 cells infected with COH1 strain overexpressing GBS80 (SEM)

452/487

Figure 214



OH1 infection of ME180 cells
F-actin Blue
α- serotype III capsule Red
α-GBS80 Green

OH1 overexpressing GBS80
infection of ME180 cells
F-actin Blue
α- serotype III capsule Red
α-GBS80 Green

Figure 215

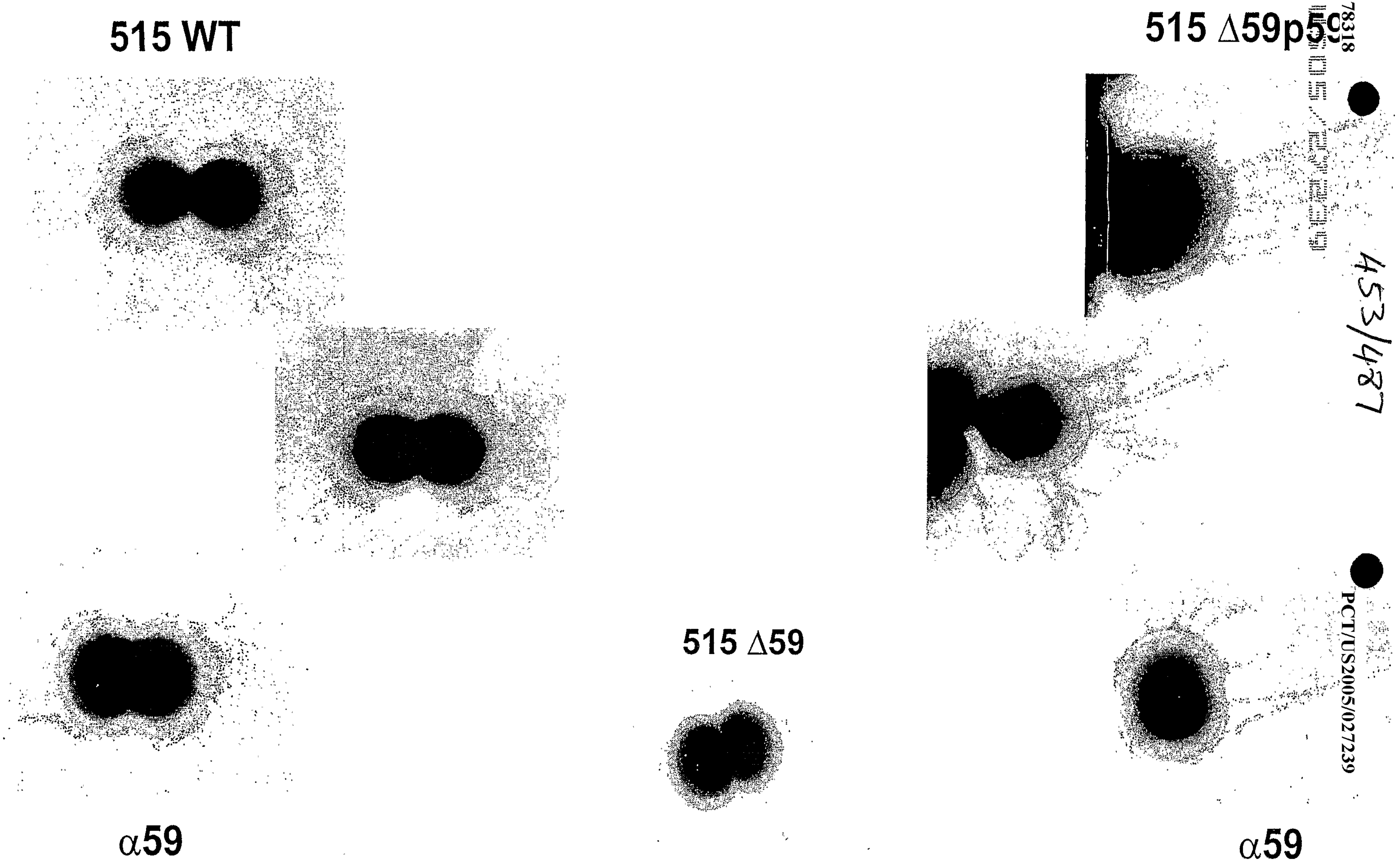
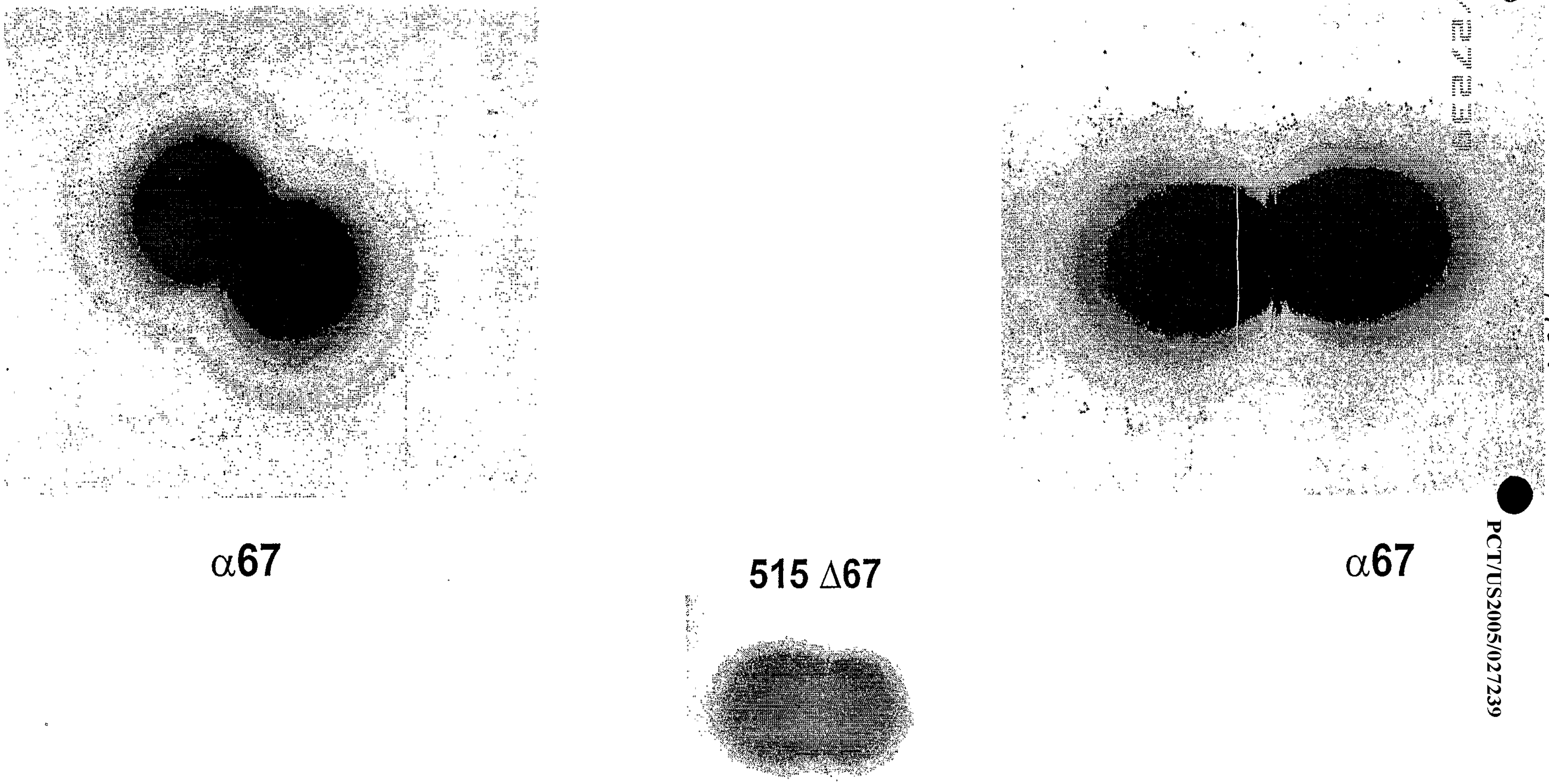


Figure 216



515 WT

515 Δ67p67

α67

α67

515 Δ67

Figure 217

GBS 67 binds to fibronectin

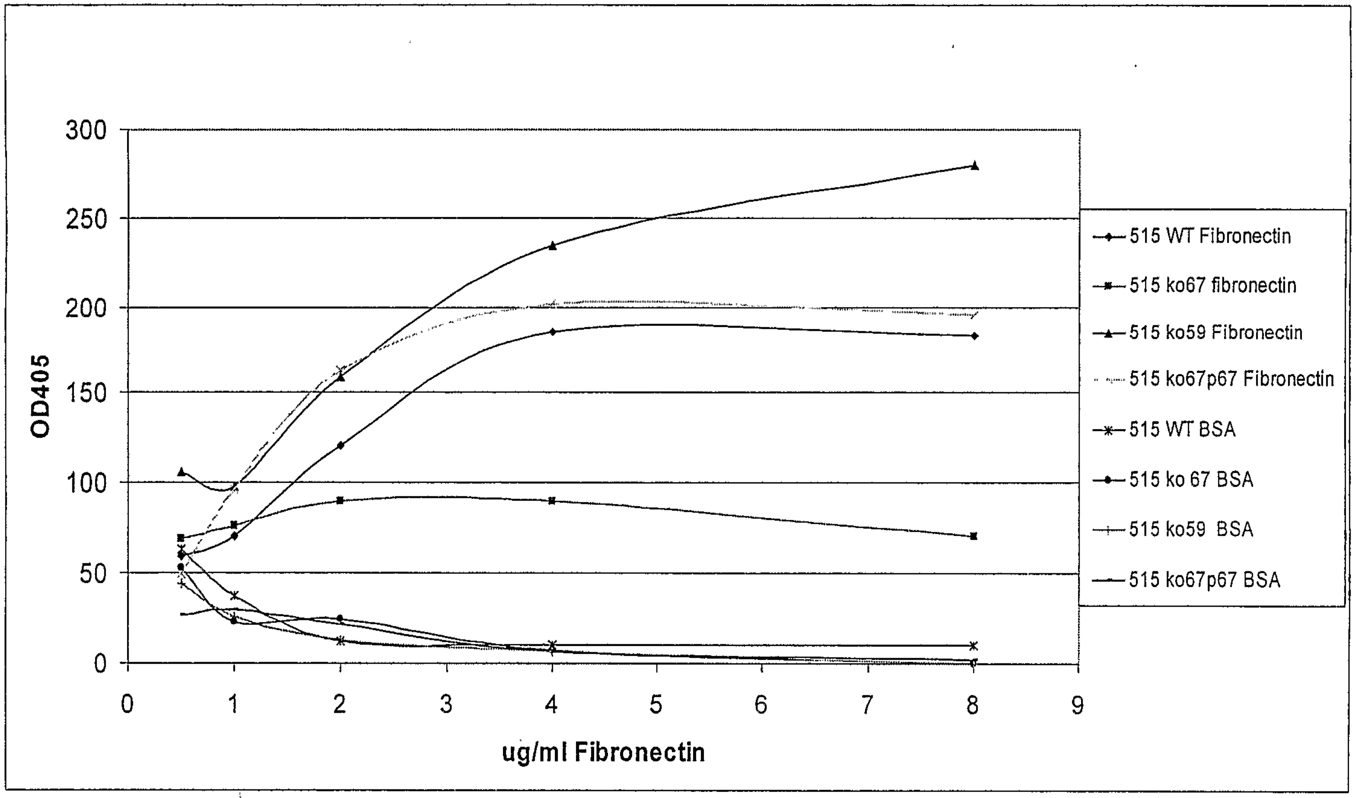
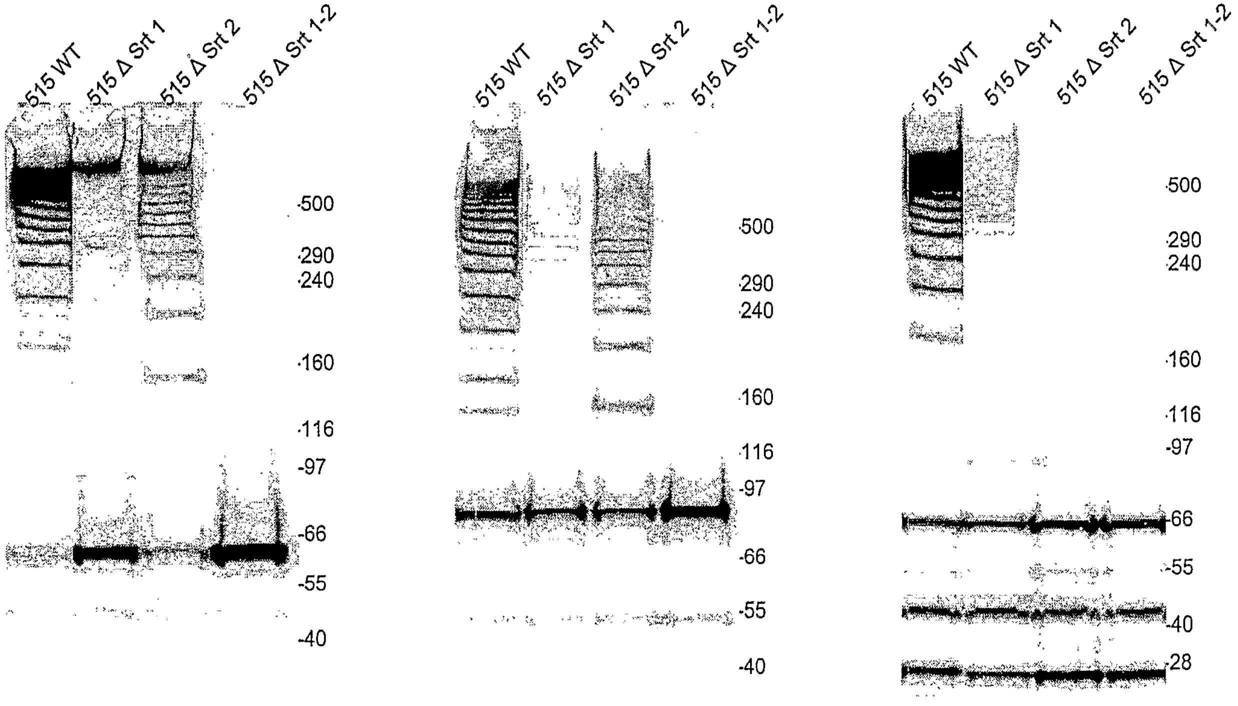


Figure 218



α-GBS 59

α-GBS 67

α-GBS 150

Figure 219

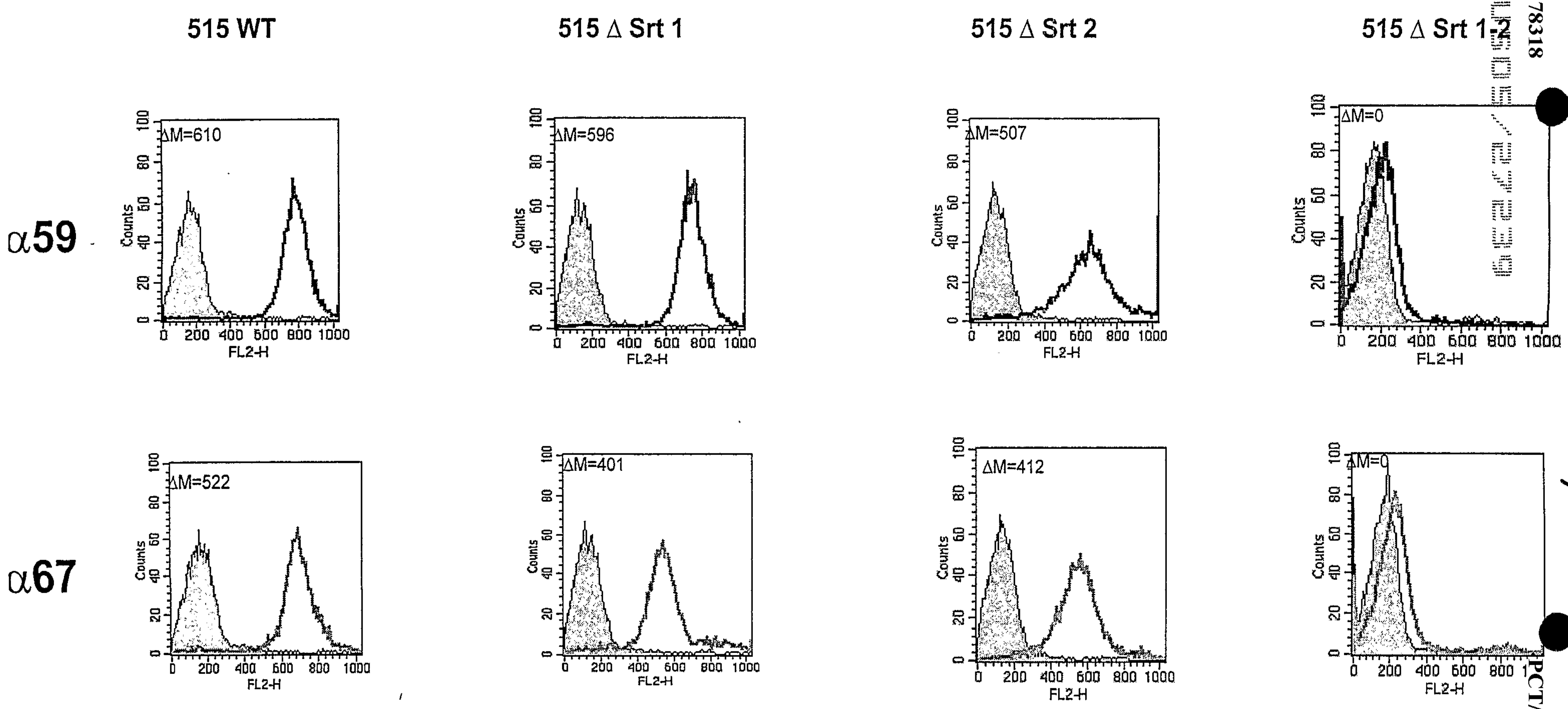

515 WT
515 Δ Srt 1
515 Δ Srt 2
515 Δ Srt 1-2
α59
α67
ΔM=610
ΔM=596
ΔM=507
ΔM=0
ΔM=522
ΔM=401
ΔM=412
ΔM=0
Counts
0
20
40
60
80
100
FL2-H
0
200
400
600
800
1000

Figure 220

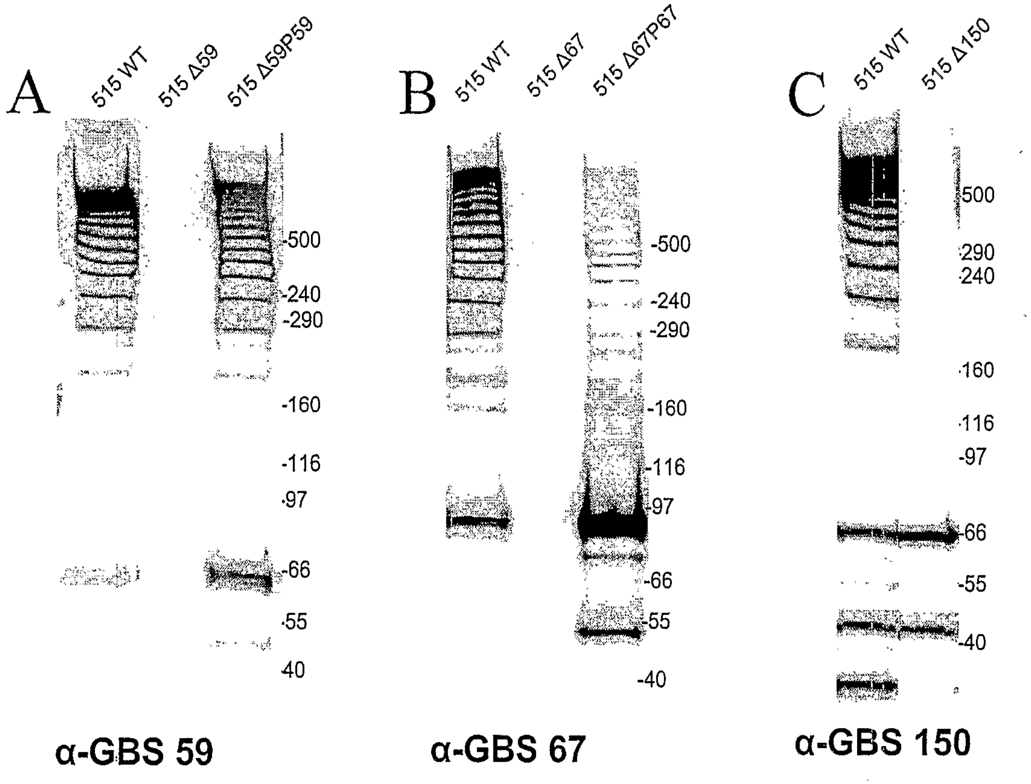

A
515 WT
515 Δ59
515 Δ59P59
-500
-240
-290
-160
-116
97
-66
55
40
α-GBS 59
B
515 WT
515 Δ67
515 Δ67P67
-500
-240
-290
-160
-116
97
-66
-55
-40
α-GBS 67
C
515 WT
515 Δ150
500
290
240
160
116
-97
66
-55
-40
α-GBS 150

Figure 221

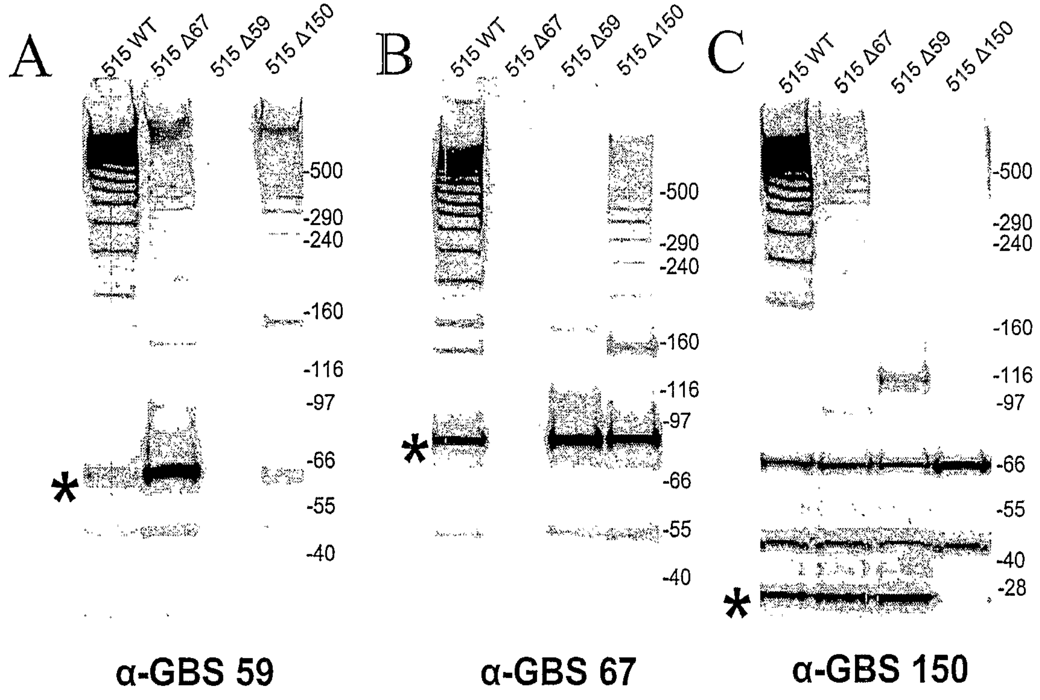

A
515 WT
515 Δ67
515 Δ59
515 Δ150
-500
-290
-240
-160
-116
-97
-66
-55
-40
*
α-GBS 59
B
515 WT
515 Δ67
515 Δ59
515 Δ150
-500
-290
-240
-160
-116
-97
-66
-55
-40
*
α-GBS 67
C
515 WT
515 Δ67
515 Δ59
515 Δ150
-500
-290
-240
-160
-116
-97
-66
-55
-40
-28
*
α-GBS 150

Figure 222

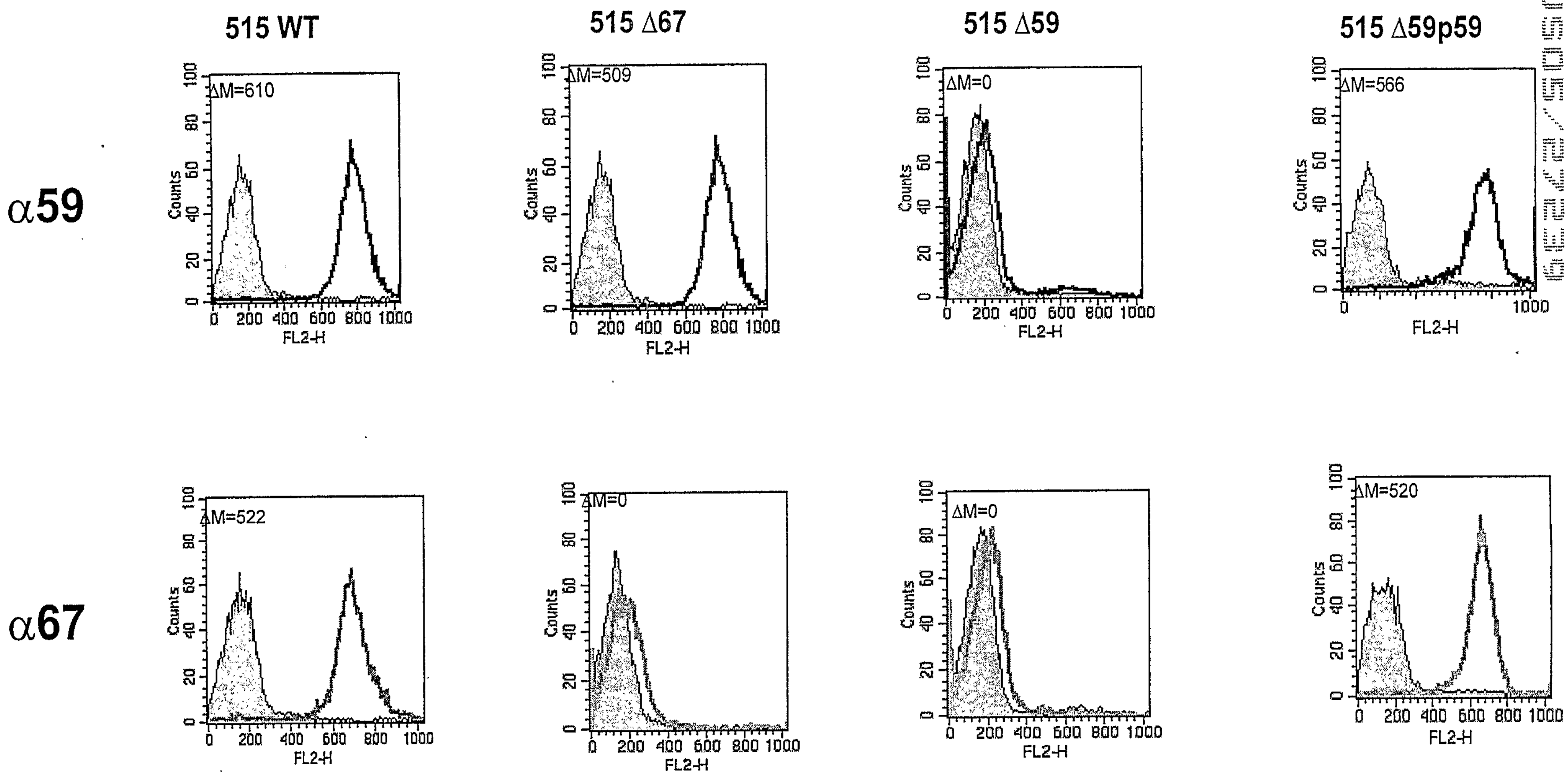
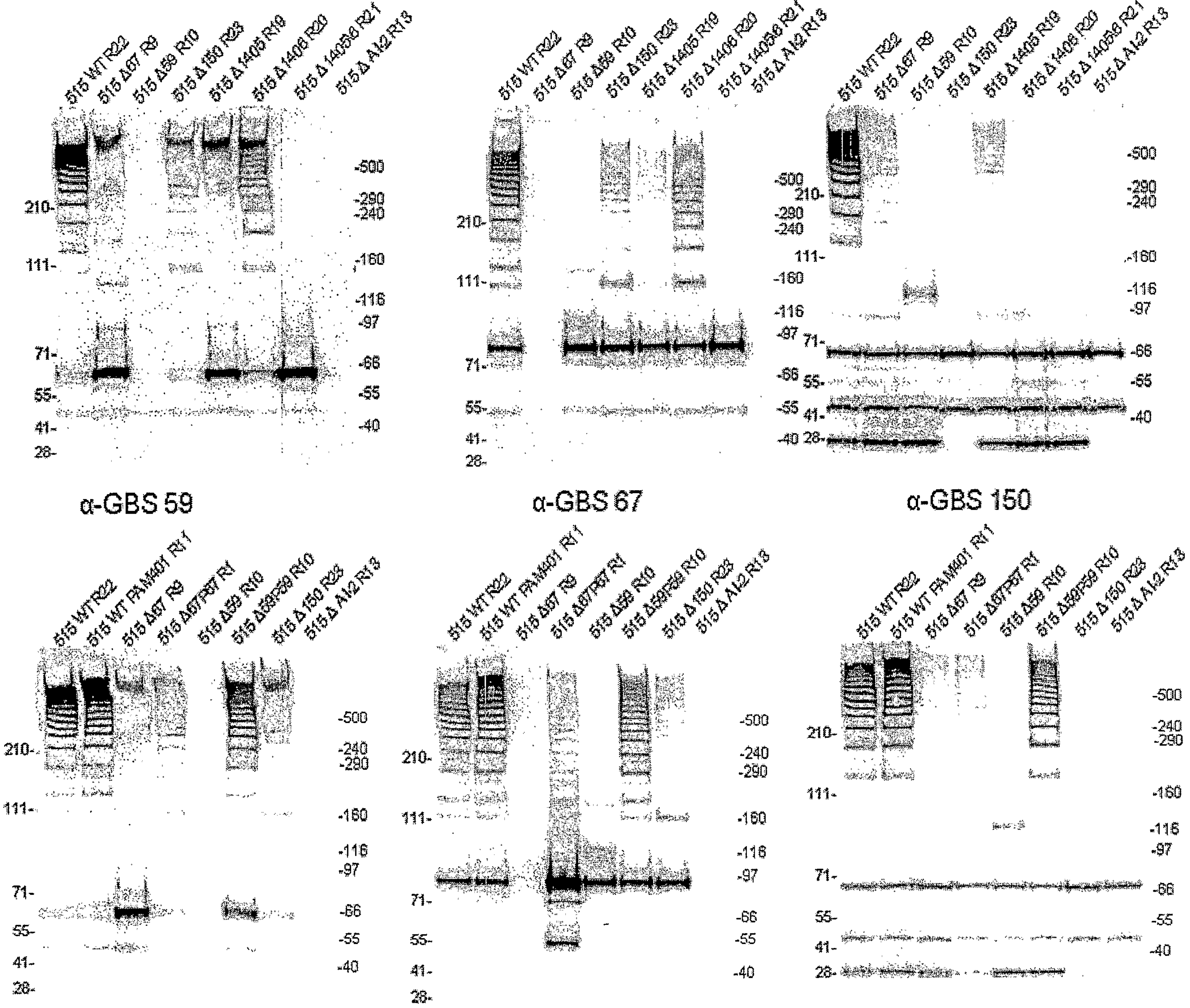
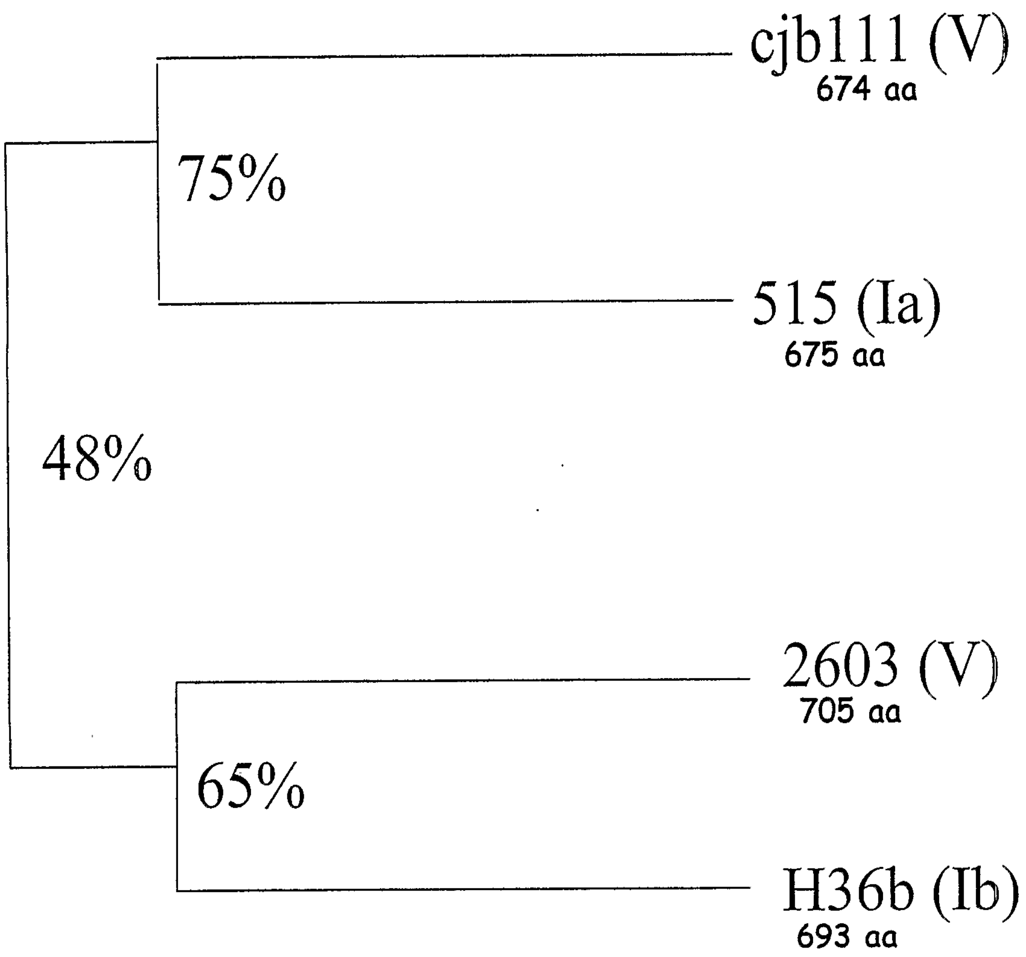

515 WT
515 Δ67
515 Δ59
515 Δ59p59
α59
α67
ΔM=610
ΔM=509
ΔM=0
ΔM=566
ΔM=522
ΔM=0
ΔM=0
ΔM=520
Counts
FL2-H
0
20
40
60
80
100
0
200
400
600
800
1000

Figure 223

Summary WB



GBS 59 allelic variants

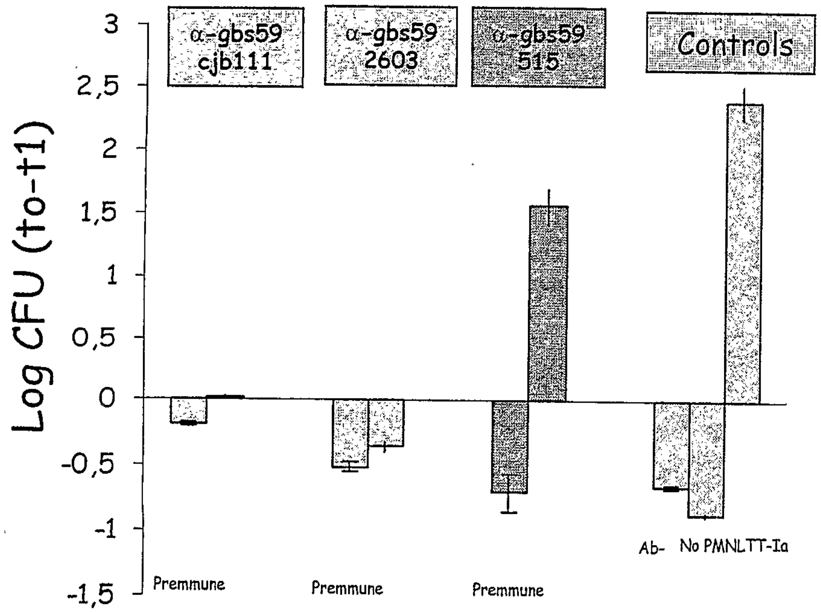


GBS strain	% AA identity
7357b (Ib)	100
5518 (Ib)	100
5364 (V)	100
1999 (IV)	100
5408 (VIII)	98
coh31 (III)	98
d136c (III)	98
nem316 (III)	98
dk1 (Ia)	100
dk8 (Ia)	100
davis (Ia)	100
5551 (Ia)	100
2986 (Ia)	100
2110 (V)	100
2210 (IV)	100
18RS21 (II)	100
3050 (II)	100
2141 (II)	100
1998 (III)	100
2928 (VII)	99,9
2274 (IV)	99,9
2129 (Ib)	99,7
5401 (II)	99,8

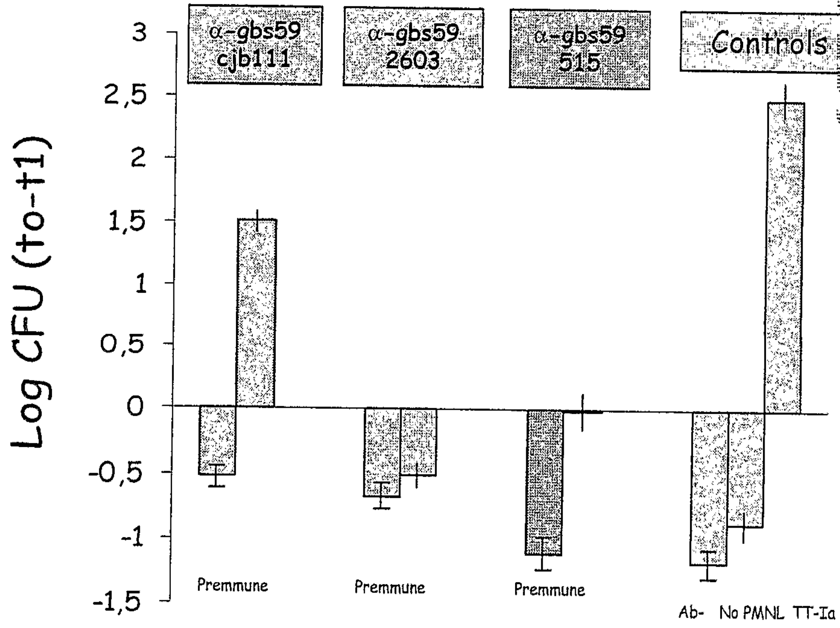
Figure 224

Figure 225

GBS 59 is opsonic only against homologous strain



• 515 (Ia) GBS strain



• cjb111 (V) GBS strain

Figure 226 A

GBS strains	Type	GBS 59		
		PCR	FACS (a-cjb111)	FACS (a-2603)
DK1	Ia	+	565	
DK8		+	559	
Davis		+	577	
515		+	583	0
090		+	0	0
2986		+	443	
5551		+	524	
H36B	Ib	+	0	410
7357b-		+	596	
5518		+	190	
D136C	III	+	504	
COH31		+	505	
1998		+	59	510
18RS21	II	+	0	353
DK21		+	249	0
3050		+	0	570
5401		+	0	400
2141		+	0	371
CJB111	V	+	625	0
2603		+	0	73
5364		+	593	
2110		+	590	0
2274	IV	+	0	400
1999		+	594	
2210		+	636	
5408	VIII	+	537	
CJB110	NT	+	0	0
1169		+	227	0

GBS strains	Type	GBS 59		
		PCR	FACS (a-cjb111)	FACS (a-2603)
A909	Ia	-	22	
2177	Ib	-	75	
COH1	III	-	0	0
M732		-	0	
M781		-	17	
5376		-	60	
5435		-	55	
SMU071	VIII	-	0	
JM9130013		-	0	0

Figure 226 B

Figure 227 A

		FACS (D Mean)				
GBS strains	Type	GBS 80	GBS 104	GBS 67	GBS 322	GBS 59
DK1	Ia	0	0	478	153	565
DK8		0	0	475	213	559
Davis		0	0	430	86	577
515		0	0	409	227	583
090		0	0	0	0	0
A909		46	29	0	0	0
2986		0	0	397	0	443
5551		0	0	485	36	524
2177	Ib	477	355	66	323	0
H36B		0	0	444	105	410
7357b-		91	0	316	102	596
5518		31	0	162	0	190
COH1	III	305	226	0	130	0
D136C		40	40	406	460	504
COH31		0	0	273	479	505
M732		141	101	0	292	0
M781		111	136	0	224	0
1998		140	77	350	288	510
5376		165	156	0	76	0
5435		93	100	0	88	0
18RS21	II	0	0	103	471	353
DK21		0	0	331	342	249
3050		71	46	460	188	570
5401		75	28	618	135	400
2141		0	0	370	76	371
CJB111	V	365	236	481	58	625
2603		62	0	105	293	73
5364		454	281	394	463	593

2110		**0**	**0**	**589**	**0**	**590**
2274	IV	**123**	**62**	**484**	**161**	**400**
1999		**0**	**389**	**453**	**55**	**594**
2210		**0**	**0**	**574**	**0**	**636**
SMU071	VIII	**556**	**393**	**74**	**170**	**0**
JM9130013		**587**	**436**	**72**	**133**	**0**
5408		**0**	**0**	**433**	**0**	**537**
CJB110	NT	**0**	**0**	**245**	**587**	**0**
1169		**0**	**0**	**443**	**213**	**227**
D Mean > 200		**6/37 (16%)**	**7/37 (19%)**	**24/37 (65%)**	**14/37 (38%)**	**24/37 (65%)**

Figure 227B

Figure 228

		FACS (ΔMean)																Δmean
GBS Strain	Type	GBS 80 142-F		GBS 104 Mab		GBS 322 86		GBS 67 81		GBS 67 H36B		GBS 59 2603		GBS 59 CJB111		GBS 59 515		neg. control
cdc-1	II	114	95	0	0	122	122	360	341	422	403	92	73	254	235	306	287	19
cdc-2	IB	173	69	92	0	95	75	552	448	590	486	135	31	635	531	197	93	104
cdc-3	II	566	508	360	302	85	60	364	306	433	375	111	53	448	390	310	252	58
cdc-4	V	524	432	337	245	284	204	577	485	625	533	105	13	674	582	303	211	92
cdc-5	II	140	0	0	0	462	300	487	297	563	373	175	0	373	183	440	250	190
cdc-6	V	544	484	361	301	95	95	586	526	601	541	55	0	686	626	302	242	60
cdc-7	III	155	116	44	5	134	118	95	56	138	99	74	35	92	53	91	52	39
cdc-8	III	347	304	192	149	74	62	98	55	170	127	72	29	88	45	108	65	43
cdc-9	II	89	65	0	0	226	191	390	366	504	480	181	157	317	293	410	386	24
cdc-10	IA	46	24	0	0	152	152	494	472	531	509	43	21	16	0	48	26	22
cdc-11	IA	17	0	0	0	295	135	569	550	569	550	47	28	467	448	648	629	19
cdc-12	V	439	430	290	281	60	30	174	165	227	218	52	43	139	130	207	198	9
cdc-13	IA	33	0	0	0	216	146	469	436	469	436	100	67	361	328	571	538	33
cdc-14	III	78	68	10	0	213	191	50	40	85	75	38	28	69	59	67	57	10
cdc-15	III	119	53	24	0	108	98	48	0	127	61	89	23	105	39	100	34	66
cdc-16	V	363	335	177	149	310	270	70	42	127	99	48	20	130	102	128	100	28
cdc-17	III	160	0	163	0	408	248	377	217	410	250	441	281	359	199	167	7	160
cdc-18	III	49	28	0	0	239	218	34	13	36	15	16	0	49	28	56	35	21
cdc-19	III	182	101	0	0	361	280	310	229	312	231	384	303	220	139	0	0	81
cdc-20	V	348	304	203	159	380	336	166	122	211	167	114	70	232	188	128	84	44
cdc-21	II	222	132	83	0	150	60	331	241	336	246	0	0	420	330	59	0	90
cdc-22	IA	0	0	13	13	43	43	238	238	238	238	43	43	38	38	429	429	0
cdc-22 (9-6-05)		23	0	34	0	110	20	310	220	320	230	113	23	117	27	344	254	90
cdc-23	V	484	484	374	374	278	278	124	124	206	206	11	11	91	91	236	236	0
cdc-24	V	137	52	0	0	333	248	90	5	110	25	110	25	120	35	70	0	85
cdc-25	IA	0	0	0	0	351	190	530	370	565	405	495	335	442	282	625	465	160
cdc-26	II	117	2	0	0	185	70	210	95	285	170	30	0	175	60	210	95	115
cdc-27	III	323	95	34	0	498	270	346	118	406	178	424	196	314	86	64	0	228
cdc-28	V	150	92	20	0	132	74	462	404	505	447	0	0	526	468	78	20	58
cdc-29	IV	90	73	65	48	195	178	90	73	150	133	150	133	138	121	110	93	17
cdc-30	V	390	187	336	133	348	145	229	26	244	41	113	0	268	65	223	20	203
cdc-31	IA	22	0	68	0	306	182	368	244	386	262	126	2	248	124	426	302	124
cdc-32	IA	45	0	12	0	260	175	190	105	205	120	30	0	100	15	185	100	85
cdc-33	II	50	0	0	0	306	156	134	0	237	87	4	0	180	30	190	40	150
cdc-34	III	152	60	47	0	342	250	44	0	74	0	27	0	102	8	48	0	92
cdc-35	V	227	227	40	40	246	246	395	395	415	415	0	0	550	550	142	142	0
cdc-36	IB	25	15	8	0	30	20	154	144	174	164	33	23	222	212	20	10	10
cdc-37	III	168	53	61	0	361	246	82	0	133	18	83	0	132	17	75	0	115
cdc-38	II	140	14	30	0	338	212	124	0	198	72	158	32	138	12	104	0	126
cdc-39	II	126	0	0	0	316	148	466	298	514	346	438	270	184	16	34	0	168
cdc-40	V	420	366	214	160	22	0	103	49	162	108	90	36	209	155	192	138	54
cdc-41	II	146	31	15	0	380	265	330	215	425	310	140	25	280	165	315	200	115

Figure 229

Expected strain coverage

MIX GBS proteins

	vaccine options	w/o 59	w/o 322	w/o 104+322	w/o 59+322		
n. antigens FACS+++	80+104+67+59+322	80+104+67+322	80+104+67+59	80+67+59	80+104+67	80+67	80+59
1	89%	89%	80%	80%	79%	79%	74%
2	74%	51%	71%	64%	24%	16%	16%
3	23%	14%	17%	16%	13%		

- GBS 322 but not GBS 59 is important to increase strain coverage
- GBS 59 probably could be useful to increase the vaccine strength

Assumption:

- Protein antigens that are highly accessible to antibodies confer 100% protection with suitable adjuvants

Figure 230

GBS 59 opsonophagocytic activity is comparable to that of the four-protein mix

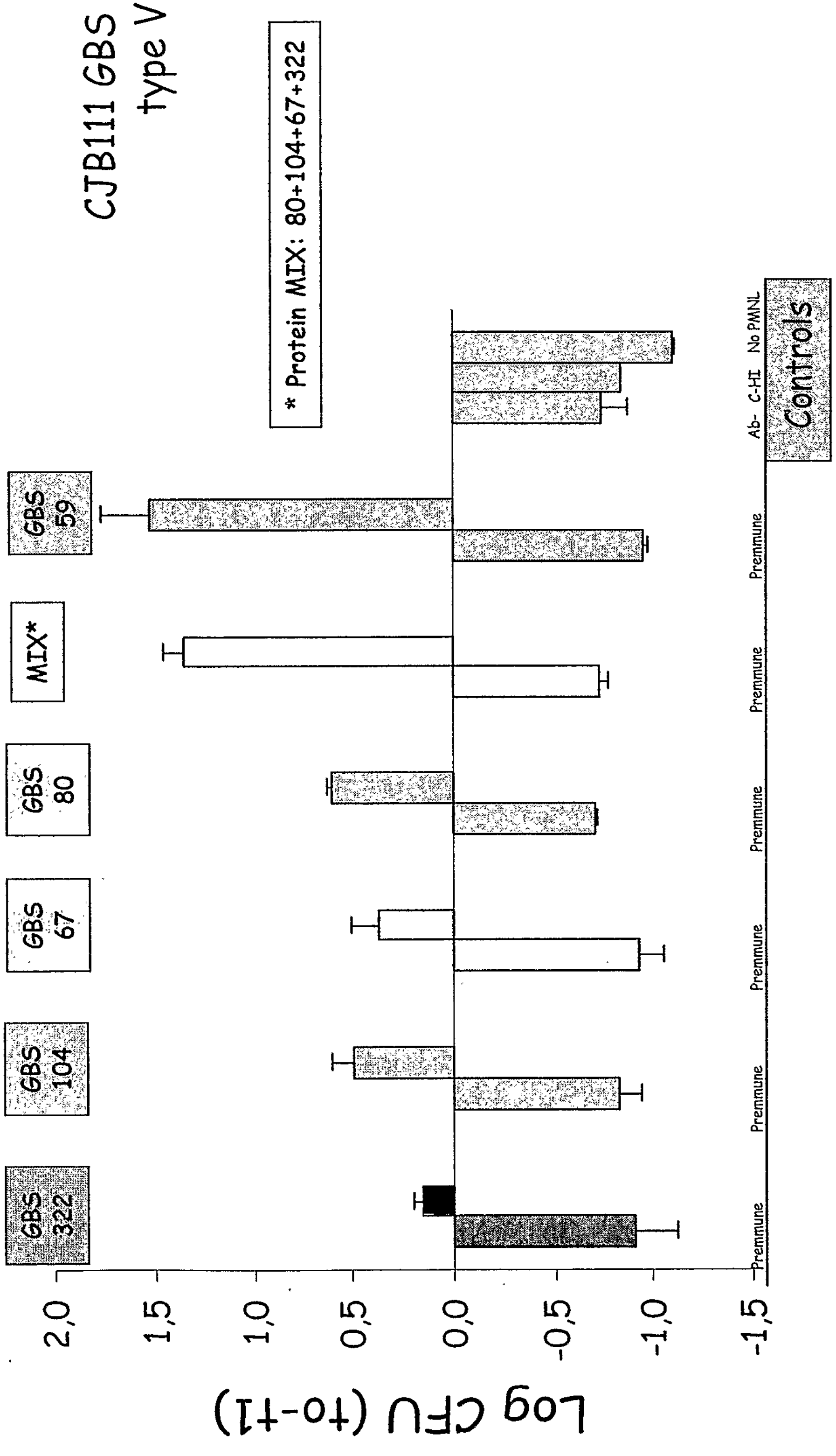
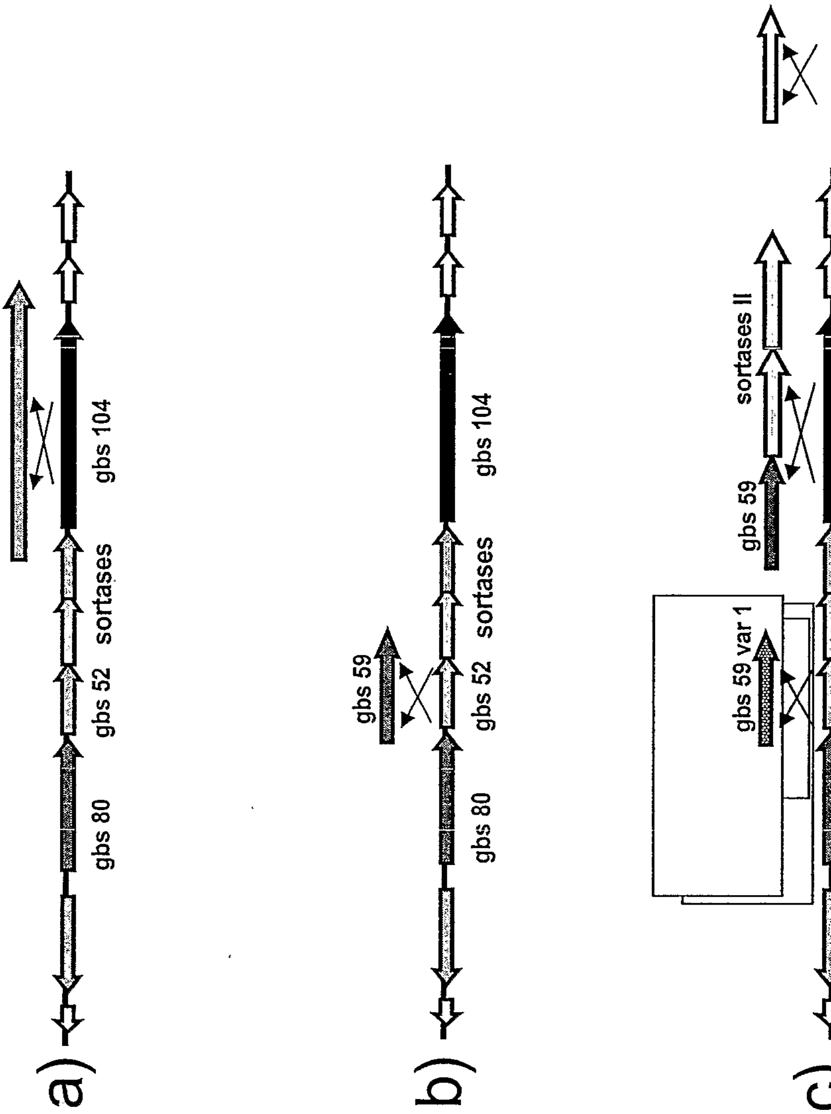


Figure 231


a)
gbs 67
gbs 80
gbs 52
sortases
gbs 104
b)
gbs 59
gbs 80
gbs 52
sortases
gbs 104
c)
gbs 59 var 1
gbs 59
sortases II
gbs 80
gbs 52
sortases
gbs 104

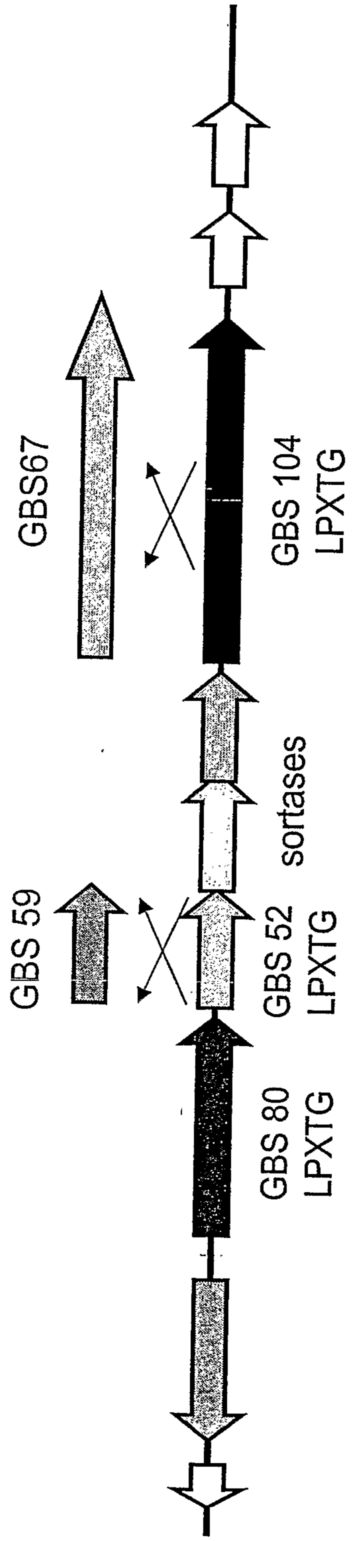


Figure 232

Figure 233

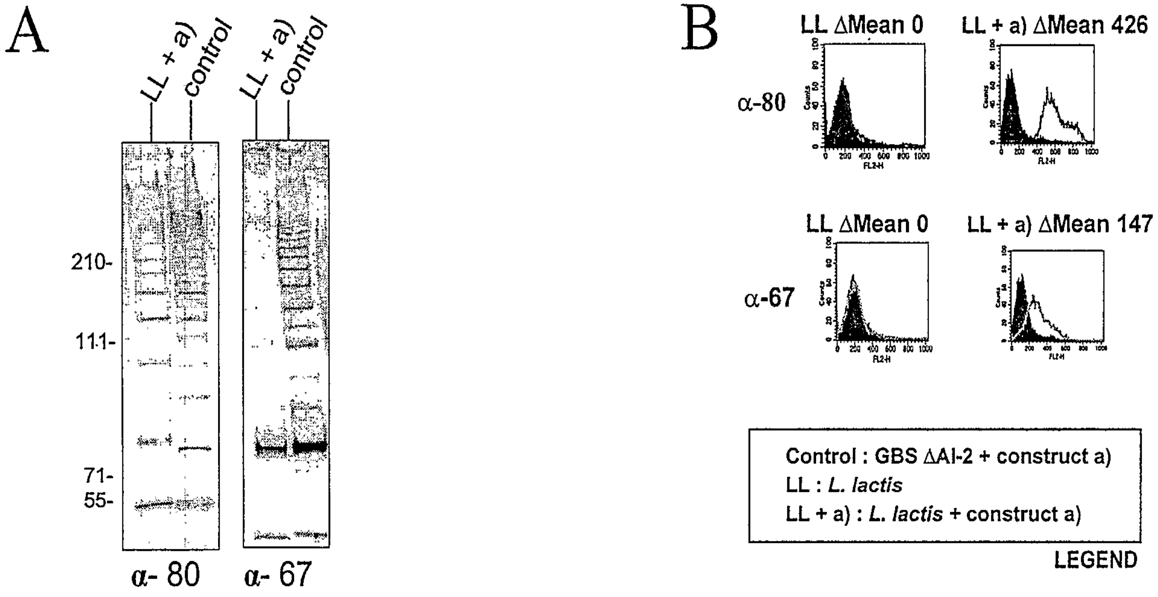
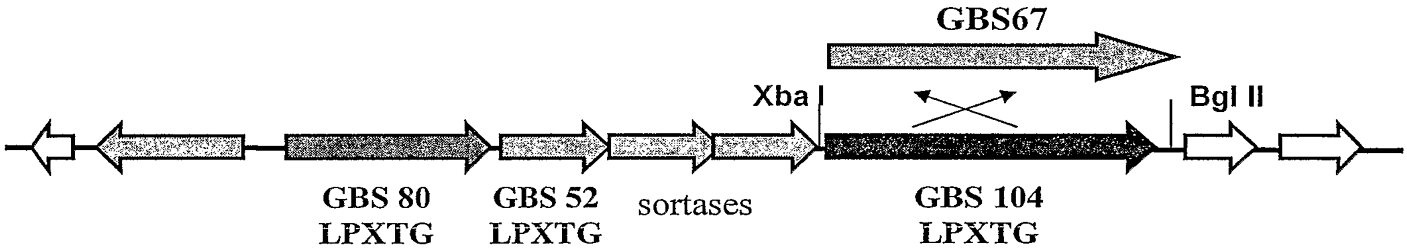

A
LL + a)
control
LL + a)
control
210-
111-
71-
55-
α- 80
α- 67
B
LL ΔMean 0
LL + a) ΔMean 426
α-80
LL ΔMean 0
LL + a) ΔMean 147
α-67
Counts
FL2-H
0
200
400
600
800
1000
Control : GBS ΔAI-2 + construct a)
LL : *L. lactis*
LL + a) : *L. lactis* + construct a)
LEGEND

Figure 234 A

Introducing Heterologous Antigens into AI-1 pilus to Obtain Protection Across GBS Strains

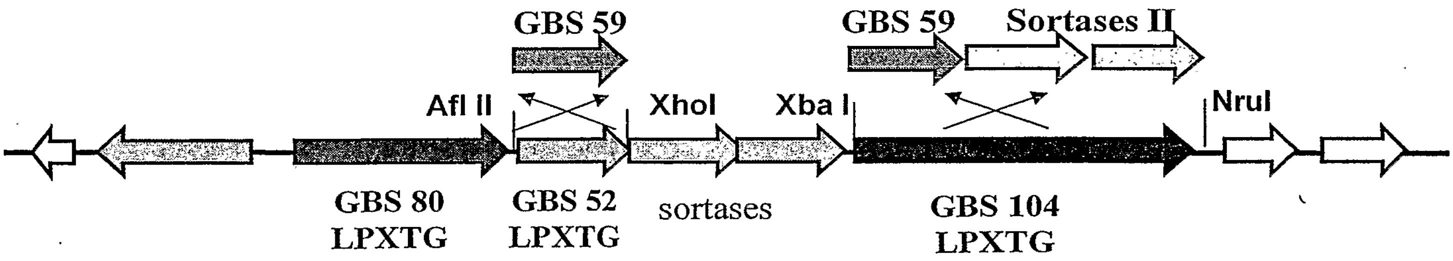
1- Substitution of GBS 104 with GBS67 from Island II



Oligo GBS67pAMXbafor AGTCAGTCTCTAGACGGCACAATAGGAGTTGTAAA
Oligo GBS67pAMBglrev CACCTGTCATAGATCTTAAGAATACTAAAGCGCATAA

2- Substitution of GBS52 or 104 with:

a) **GBS 59 alleles 515 or CJB**
b) **GBS 59 allele CJB111 + sortases island II**
c) **GBS 59 allele 515 + GBS 59 CJB111 + sortases island II**



DETAILS:

a) Oligos to be used:
Oligo 59pAMAflfor1 AGTCAGTCCTTAAGCCGCATATTATTAATCATGTTG (allele 515)
Oligo 59pAMAflfor1 AGTCAGTCCTCGAGTTAAACTTCCTCTGATTGACG (allele 515)
Oligo 59pAMAflfor2 AGTCAGTCCTTAAGAAGGAGTGGTGCTGCGGTAA (allele CJB111)
Oligo 59pAMXhorev2 AGTCAGTCCTCGAGTTAAGCTTCCTCTGATTGACG (allele CJB111)

b) Oligos to be used:

Oligo GBS59XbaF CTAGTGATATATCTAGAGAAAAAG
Oligo Sort59NruR CTAGCTAGTCGCGACTTTTTCATTTTTGATTTCCCTTTC

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Figure 234 B

3- Substitution of GBS104 with a fusion of GBS322-GBS67 to include GBS 322 into AI-1

a) Construct 1: GBS67 complete sequenze included

b) Construct 2: Only part of GBS 67 was included *(deleted bold region)*

DETAILS:

a) Construct 1:

Legend:

Pink GBS322

Black GBS67

Black Bold: fragment of GBS67 eliminated in costruct 2

Green PK motifs

Yellow E motifs

Red LPXTG

> gbs67-515 + 322

MRKYQKFSKILTLSLFCLSQIPLNTNVLGESTVPENGAKGKLVVKKTDDQNKPLSKATFV
LKTTAHPESKIEKVTAELTGEATFDNLIPGDYTLSEETAPEGYKKTNQTWQVKVESNGKT
TIQNSGDKNSTIGQNQEELDKQYPPTGIYEDTKESYKLEHVKGSVPNGKSEAKAVNPYSS
EGEHIREIPEGTLSKRISEVGDLAHNKYKIELTVSGKTIVKPVDKQKPLETDTTWTARTVSEV
KADLVKQDNKSSYTVKYGDTLSVISEAMSIDMNVLAKINNIADINLIYPETTLTVTYDQKSHTA
TSMKIETPATNAAGQTTATVDLKTNQVSVADQKVSLNTISEGMTPEAATTIVSPMKTYSSAP
ALKSKEVLAQEQAVSQAAANEQVSPAPVKSITSEVPAAKEEVKPTQTSVSQSTTVSPASVA
AETPAPVAKVAPVRTVAAPRVASVKVVTPKVETGASPEHVSAPAVPVTTTSPATDSKLQAT
EVKSVPVAQKAPTATPVAQPASTTNAVAAHPENAGLQPHVAAYKEKVASTYGVNEFSTYRAG
DPGDHGKGLAVDFIVGTNQALGNKVAQYSTQNMAANNISYVIWQQKFYSN
TNSIYGPANTWNAMPDRGGVTANHYDHVHVSFNK*DVVFVLDNSNS*
MNNDGPNFQRHNKAKKAAEALGTAVKDILGANSDNRVALVTYGSDIFDGRSVDVVKGFKE
DDKYYGLQTKFTIQTENYSHKQLTNNAEEIIKRIPTEAPKAKWGSTTNGLTPEQQKEYYL
SKVGETFTMKAFMEADDILSQVNRNSQKIIVHVTDGVPTRSYAINNFKLGASYESQFEQM
*KKNGYLNKSNFLLTDKPDDIKGN*GESYFLFPLDSYQTQIISGNLQKLHYLDLNLNYPKGT
IYRNGPVKEHGTPTKLYINSLKQKNYDIFNFGIDISGFRQVYNEEYKKNQDGTFQKLKEE

AFKLSDGEITELMRSFSSKPEYYTPIVTSADTSNNEILSKIQQQFETILTKENSIVNGTI
EDPMGDKINLQLGNGQILQPSDYTLQGNDGSVMKDGIATGGPNNDGGILKGVKLEYIGNK
LYVRGLNLGEGQKVTLTYDVKLDDSFISNKFYDTNGRTTLNPKSEDPNTLRDFPIPKIRD
VREYPTITIKNEKKLGEIEFIKVDKDNNKLLLKGATFELQEFNEDYKLYLPIKNNNSKVV
TGENGKISYKDLKDGKYQLIEAVSPEDYQKITNKPILTFEVVKGSIKNIIAVNKQISEYH
EEGDKHLITNTHIPPKGIPKTGGKGILSFILIGGAMMSIAGGIYIWKRYKKSSDMSIKK
D

Figure 234 C

b) Construct 2:

\>gbs67-515 deleted+ 322

MRKYQKFSKILTLSLFCLSQIPLNTNVLGESTVPENGAKGKLVVKKTDDQNKPLSKATFV
LKTTAHPESKIEKVTAELTGEATFDNLIPGDYTLSEETAPEGYKKTNQTWQVKVESNGKT
TIQNSGDKNSTIGQNQEELDKQYPPTGIYEDTKESYKLEHVKGSVPNGKSEAKAVNPYS
SEGEHIREIPEGTLSKRISEVGDLAHNKYKIELTVSGKTIVKPVDKQKPLETDTTW
TARTVSEVKADLVKQDNKSSYTVKYGDTLSVISEAMSIDMNVLAKINNIADINLIYPETTLTV
TYDQKSHTATSMKIETPATNAAGQTTATVDLKTNQVSVADQKVSLNTISEGMTPEAATT
VSPMKTYSSAPALKSKEVLAQEQAVSQAAANEQVSPAPVKSITSEVPAAKEEVKPTQTS
VSQSTTVSPASVAAETPAPVAKVAPVRTVAAPRVASVKVVTPKVETGASPEHVSAPAVP
VTTTSPATDSKLQATEVKSVPVAQKAPTATPVAQPASTTNAVAAHPENAGLQPHVAAYK
EKVASTYGVNEFSTYRAGDPGDHGKGLAVDFIVGTNQALGNKVAQYSTQNMAANNISYV
IWQQKFYSNTNSIYGPANTWNAMPDRGGVTANHYDHVHVSFNKGESYFLFPLDSYQTQ
IISGNLQKLHYLDLNLNYPKGTIYRNGPVKEHGTPTKLYINSLKQKNYDIFNFGIDISGFRQ
VYNEEYKKNQDGTFQKLKEEAFKLSDGEITELMRSFSSKPEYYTPIVTSADTSNNEILSKI
QQQFETILTKENSIVNGTIEDPMGDKINLQLGNGQILQPSDYTLQGNDGSVMKDGIATGG
PNNDGGILKGVKLEYIGNKLYVRGLNLGEGQKVTLTYDVKLDDSFISNKFYDTNGRTTLN
PKSEDPNTLRDFPIPKIRDVREYPTITIKNEKKLGEIEFIKVDKDNNKLLLKGATFELQEFNE
DYKLYLPIKNNNSKVVTGENGKISYKDLKDGKYQLIEAVSPEDYQKITNKPILTFEVVKGS
IKNIIAVNKQISEYHEEGDKHLITNTHIPPKGIPKTGGKGILSFILIGGAMMSIAGGIYIWKRY
KKSSDMSIKKD

Oligos to be used:

Oligo GBS67pAMXbafor (vedi operone)
AGTCAGTCTCTAGACGGCACAATAGGAGTTGTAAA
XbaI

Oligo GBS67soe1rev
GCACGTCGTATCTGTTTCTAACGGCTTTTGTTTGTCCACT

Oligo GBS322soe2for
GACAAACAAAAGCCGTTAGAAACAGATACGACGTGGACAC

Oligo GBS322soe2rev1 (per costrutto non deleto in 67)
GAGTACGAAGACAACATCTTTGTTAAATGATACGTGAACC

Oligo GBS322soe2rev2 (per costrutto deleto in 67)
TAAAAAGTAACTCTCCCCTTTGTTAAATGATACGTCAACC

Oligo fine67soe3for1 (per costrutto non deleto in 67)
CACGTATCATTTAACAAAGATGTTGTCTTCGTACTCGAT

Oligo fine67soe3for2 (per costrutto non deleto in 67)
CACGTATCATTTAACAAAGGGGAGAGTTACTTTTTATTTCC

Oligo GBS67pAMBglrev (vedi operone)
CACCTGTCATAGATCTTAAGAATACTAAAGCGCATAA
BglII

Figure 234 D

PCR Soe1: **GBS67pAMXbafor + GBS67soe1rev 727 bp**

PCR Soe2 non del: **GBS322soe2for + GBS322soe2rev1 1260 bp**

PCR Soe2 del: **GBS322soe2for + GBS322soe2rev2 1260 bp**

PCR Soe3 non del: **fine67soe3for1 + GBS67pAMBglrev 2061 bp**

PCR Soe3 del: **fine67soe3for2 + GBS67pAMBglrev 1419 bp**

PCR Soe4 non del. PCR25: **GBS67pAMXbafor + GBS67pAMBglrev 4000 bp**
Substrato PCRSoe1, 2, 3 non del

PCR Soe4 del, PCR26: **GBS67pAMXbafor + GBS67pAMBglrev 3312 bp**
Substrato PCRSoe1, 2, 3 del

4- Substitution of GBS 52 with a fusion of GBS322-GBS52 to include GBS 322 into AI-1

(same legend as for GBS67 derivatives)

a) Construct 1: GBS52 complete sequenze included

b) Construct 2: Only part of GBS 52 was included *(deleted bold region)*

DETAILS:

a) Construct 1:

>GBS322-52 senza delezione di 52 (B) PCR 24

MKMNKKVLLTSTMAASLLSVASVQAQETDTTWTARTVSEVKADLVKQDNK
SSYTVKYGDTLSVISEAMSIDMNVLAKINNIADINLIYPETTLTVTYDQK
SHTATSMKIETPATNAAGQTTATVDLKTNQVSVADQKVSLNTISEGMTPE
AATTIVSPMKTYSSAPALKSKEVLAQEQAVSQAAANEQVSPA
PVKSITSEVPAAKEEVKPTQTSVSQSTTVSPASVAAETPAPVAKVAPVRTVAAPRVAS
VKVVTPKVETGASPEHVSAPAVPVTTTSPATDSKLQATEVKSVPVAQKAP
TATPVAQPASTTNAVAAHPENAGLQPHVAAYKEKVASTYGVNEFSTYRAG
DPGDHGKGLAVDFIVGTNQALGNKVAQYSTQNMAANNISYVIWQQKFYSN
TNSIYGPANTWNAMPDRGGVTANHYDHVHVSFNK *HQLTIVHLEARDIDRPNPQL*
EIAPKEGTPIEGVLYQLYQLKSTEDGDLLAHWNSLTITELKKQAQQVFEA
*TTNQ*QGKATFNQLPDGIYYGLAVKAGEKNRNVSAFLVDLSEDKVIYPKII
WSTGELDLLKVGVDGDTKKPLAGVVFELYEKNGRTPIRVKNGVHSQDIDA
AKHLETDSSGHIRISGLIHGDYVLKEIETQSGYQIGQAETAVTIEKSKTV

TVTIENKKVPTPKVPSRGGLRKTCEQQAMALVIIGGILIALALRLLSKH
RKHQNKD

Figure 234 E

b) Construct 2:

>GBS322-52 (A) PCR 23

MKMNKKVLLTSTMAASLLSVASVQAQETDTTWTARTVSEVKADLVKQDNK
SSYTVKYGDTLSVISEAMSIDMNVLAKINNIADINLIYPETTLTVTYDQK
SHTATSMKIETPATNAAGQTTATVDLKTNQVSVADQKVSLNTISEGMTPE
AATTIVSPMKTYSSAPALKSKEVLAQEQAVSQAAANEQVSPA
PVKSITSEVPAAKEEVKPTQTSVSQSTTVSPASVAAETPAPVAKVAPVRTVAAPRVAS
VKVVTPKVETGASPEHVSAPAVPVTTTSPATDSKLQATEVKSVPVAQKAP
TATPVAQPASTTNAVAAHPENAGLQPHVAAYKEKVASTYGVNEFSTYRAG
DPGDHGKGLAVDFIVGTNQALGNKVAQYSTQNMAANNISYVIWQQKFYSN
TNSIYGPANTWNAMPDRGGVTANHYDHVHVSFNK
QGKATFNQLPDGIYYGLAVKAGEKNRNVSAFLVDLSEDKVIYPKII
WSTGELDLLKVGVDGDTKKPLAGVVFELYEKNGRTPIRVKNGVHSQDIDA
AKHLETDSSGHIRISGLIHGDYVLKEIETQSGYQIGQAETAVTIEKSKTV
TVTIENKKVPTPKVPSRGGLPKTGEQQAMALVIIGGILIALALRLLSKH
RKHQNKD

Oligos to be used:

Oligo 322Aflfor1

AGTCAGTCCTTAAGGATATTATAGTCTCGGACTA

Afl II

Oligo 52 soe1 forA

CACGTATCATTTAACAAACAAGGAAAGGCTACATTTAACC

Oligo 52 soe1 forB

TTCACGTATCATTTAACAAACATCAGTTGACGATTGTTCATC

Oligo52 soe1revA

AAATGTAGCCTTTCCTTGTTTGTTAAATGATACGTGAACC

Oligo52 soe1revB

AACAATCGTCAACTGATGTTTGTTAAATGATACGTGAACC

Oligo 52Xhorev

AAGACCTCCTCGAGATGGCACTT

Xho I

PCR Soe1A: Oligo 322Aflfor1+ Oligo 52 soe1 revA 1370 bp

PCR Soe2A: Oligo52 soe1forA + Oligo 52Xhorev 520 bp

PCR Soe3A: Oligo 322Aflfor1 + Oligo 52Xhorev 1846 bp (con PCR Soe1A + PCR Soe2A) (PCR23)

PCR Soe1B: Oligo 322Aflfor1+ Oligo 52 soe1 revB 1370 bp

PCR Soe2B: Oligo52 soe2forB + Oligo 52Xhorev 742 bp

PCR Soe3B: Oligo 322Aflfor1 + Oligo 52Xhorev 2068 bp (con PCR Soe1B + PCR Soe2B) (PCR 24)

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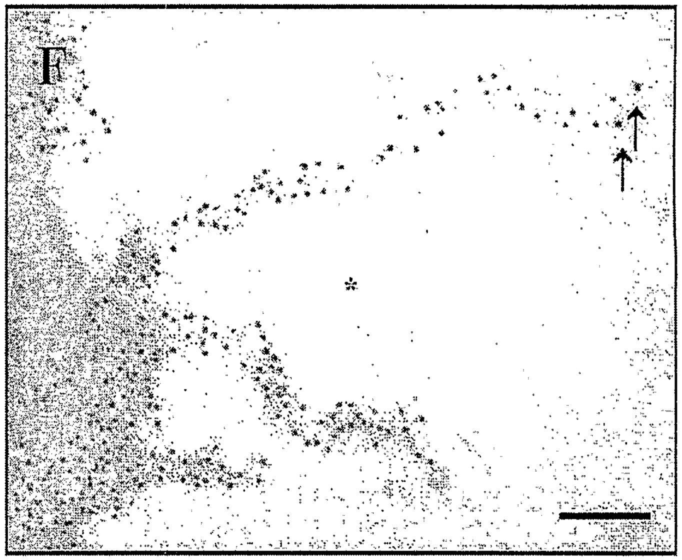

Figure 235

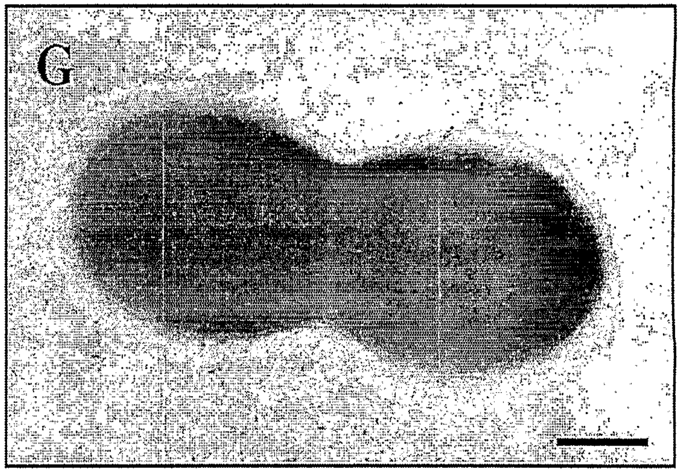

Figure 236

Strain variability - GBS67: 2 alleles

```
  1 MRKYQKFSKILTLSLFCLSQIPLNTNVLGESTVPENGAKGKLVVKKTDDQ 50
                             |||||||||||||||||||||||||
  1 .........................NVLGESTVPENGAKGKLVVKKTDDQ 25

             .         .         .         .         .
 51 NKPLSKATFVLKTTAHPESKIEKVTAELTGEATFDNLIPGDYTLSEETAP 100
    |||||||||||| |.| |||:|||| |.||||||||| ||||||||||||
 26 NKPLSKATFVLKPTSHSESKVEKVTTEVTGEATFDNLTPGDYTLSEETAP 75

             .         .         .         .         .
101 EGYKKTNQTWQVKVESNGKTTIQNSGDKNSTIGQNQEELDKQYPPTGIYE 150
    |||||| |||||||||||||||||| || | | | ||||||||| || ||
 76 EGYKKTTQTWQVKVESNGKTTIQNSDDKKSIIEQRQEELDKQYPLTGAYE 125

             .         .         .         .         .
151 DTKESYKLEHVKGSVPNGKSEAKAVNPYSSEGEHIREIPEGTLSKRISEV 200
    |||||| ||||| |:|||| |||||||||||||||||| |||||||||||
126 DTKESYNLEHVKNSIPNGKLEAKAVNPYSSEGEHIREIQEGTLSKRISEV 175

             .         .         .         .         .
201 GDLAHNKYKIELTVSGKTIVKPVDKQKPLDVVFVLDNSNSMNNDGPNFQR 250
     || |||||||||||||.|:| :.| .|||||||||||||| |.| |
176 NDLDHNKYKIELTVSGKSIIKTINKDEPLDVVFVLDNSNSMKNNGKN... 222

             .         .         .         .         .
251 HNKAKKAAEALGTAVKDILGANSDNRVALVTYGSDIFDGRSVDVVKGFKE 300
     |||||| ||. | :||:|||| :|| |||||||||||||.| |:|||||
223 .NKAKKAGEAVETIIKDVLGANVENRAALVTYGSDIFDGRTVKVIKGFKE 271

             .         .         .         .         .
301 DDKYYGLQTKFTIQTENYSHKQLTNNAEEIIKRIPTEAPKAKWGSTTNGL 350
     | ||||:| ||:|| .||:|. || | :|||:|| |||.|||| |. ||
272 .DPYYGLETSFTVQTNDYSYKKFTNIAADIIKKIPKEAPEAKWGGTSLGL 320

             .         .         .         .         .
351 TPEQQKEYYLSKVGETFTMKAFMEADDILSQVNRNSQKIIVHVTDGVPTR 400
    |||..:|| ||||||||||||||||| :|| : | |.|||||.|||||||
321 TPEKKREYDLSKVGETFTMKAFMEADTLLSSIQRKSRKIIVHLTDGVPTR 370

             .         .         .         .         .
401 SYAINNFKLGASYESQFEQMKKNGYLNKSNFLLTDKPEDIKGNGESYFLF 450
    |||||.|  |..| .|||..|. |||.|.|: :|| || |||||||||||
371 SYAINSFVKGSTYANQFERIKEKGYLDKNNYFITDDPEKIKGNGESYFLF 420
```

Differences
between strains
2603 and H36B

(AA not matching/AA
total and % of homology)

114 / 828 (87,1%)

```
451 PLDSYQTQIISGNLQKLHYLDLNLNYPKGTIYRNGPVKEHGTPTKLYINS 500
    |||||||||||||||||||||||||||||||||||||:||||||||||||
421 PLDSYQTQIISGNLQKLHYLDLNLNYPKGTIYRNGPVREHGTPTKLYINS 470

             .         .         .         .         .
501 LKQKNYDIFNFGIDISGFRQVYNEEYKKNQDGTFQKLKEEAFKLSDGEIT 550
    ||||||||||||||||||||||||:|||||||||||||||||.|||||||
471 LKQKNYDIFNFGIDISGFRQVYNEDYKKNQDGTFQKLKEEAFELSDGEIT 520

             .         .         .         .         .
551 ELMRSFSSKPEYYTPIVTSADTSNNEILSKIQQQFETILTKENSIVNGTI 600
    ||| ||||||||||||||||| |||||||||||||| |||||||||||||
521 ELMNSFSSKPEYYTPIVTSADVSNNEILSKIQQQFEKILTKENSIVNGTI 570

             .         .         .         .         .
601 EDPMGDKINLQLGNGQTLQPSDYTLQGNDGSVMKDGIATGGPNNDGGILK 650
    |||||||||| ||||||||||||||||||||:||| ||||||||||||||
571 EDPMGDKINLHLGNGQTLQPSDYTLQGNDGSIMKDSIATGGPNNDGGILK 620

             .         .         .         .         .
651 GVKLEYIGNKLYVRGLNLGEGQKVTLTYDVKLDDSFISNKFYDTNGRTTL 700
    ||||||| ||||||||||||||||||||||||||||||||||||||||||
621 GVKLEYIKNKLYVRGLNLGEGQKVTLTYDVKLDDSFISNKFYDTNGRTTL 670

             .         .         .         .         .
701 NPKSEDPNTLRDFPIPKIRDVREYPTITIKNEKKLGEIEFIKVDKDNNKL 750
    |||||:|.|||||||||||||||||||||||||||||||| |||||||||
671 NPKSEEPDTLRDFPIPKIRDVREYPTITIKNEKKLGEIEFTKVDKDNNKL 720

             .         .         .         .         .
751 LLKGATFELQEFNEDYKLYLPIKNNNSKVVTGENGKISYKDLKDGKYQLI 800
    ||||||||||||||||||||||||||||||||||||||||||||||||||
721 LLKGATFELQEFNEDYKLYLPIKNNNSKVVTGENGKISYKDLKDGKYQLI 770

             .         .         .         .         .
801 EAVSPEDYQKITNKPILTFEVVKGSIKNIIAVNKQISEYHEEGDKHLITN 850
    |||||.||||||||||||||||||||.|||||||||||||||||||||||
771 EAVSPKDYQKITNKPILTFEVVKGSIQNIIAVNKQISEYHEEGDKHLITN 820

             .         .         .         .         .
851 THIPPKGIIPMTGGKGILSFILIGGAMMSIAGGIYIWKRYKKSSDMSIKK 900
    ||||||||
821 THIPPKGI.......................................... 828
```

Figure 237

Strain variability - GBS67
Allele I (2603)

Strain	Differences in comparison with 2603 (% of homology)
2603	-
18RS21	1/833 (99.9%)
CJB111	14/833 (98.3%)
515	2/833(99.8%)

Figure 238

Strain variability - GBS67
Allele II (H36b)

Strain	Differences in comparison with H36b (% of homology)	FACS (α-67 from 2603)
H36B	-	444
1169	10/823 (98.8%)	443
090	9/316 Stop codon (8G to 7G)	0
CJB110	11/824 (98.7%)	245

Figure 239

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(54) Title: IMMUNOGENIC COMPOSITIONS FOR GRAM POSITIVE BACTERIA SUCH AS STREPTOCOCCUS AGALACTIAE

(57) Abstract: The invention relates to the identification of a new adhesin islands within the genomes of several Group A and Group B Streptococcus serotypes and isolates. The adhesin islands are thought to encode surface proteins which are important in the bacteria's virulence. Thus, the adhesin island proteins of the invention may be used in immunogenic compositions for prophylactic or therapeutic immunization against GAS or GBS infection. For example, the invention may include an immunogenic composition comprising one or more of the discovered adhesin island proteins.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US05/27239

A. CLASSIFICATION OF SUBJECT MATTER
IPC: **A61K 39/02**(2006.01)

USPC: 424/190.1
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 424/190.1

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
MEDLINE,BIOSIS, HCAPLUS, EMBASE, DERWENT, PUBLISHED APPLICATIONS AND ISSUED PATENTS.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 02/34771 A2 (TELFORD et al) 02 May 2002 (02.05.2002), see pages 1411 and 3057. (only the relevant pages provided)	1-7 and 17-24
X	LARSSON et al. Protection against experimental infection with group B streptococcus by immunization with a bivalent protein vaccine. Vaccine. February 1999, Vol. 17, No. 5, pages 454-458.	1-7 and 17-24

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance		
"E"	earlier application or patent published on or after the international filing date	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed	"&"	document member of the same patent family

Date of the actual completion of the international search 21 May 2008 (21.05.2008)	Date of mailing of the international search report 25 AUG 2008
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	Authorized officer PADMA v. BASKAR F. Roberts for Telephone No. 571-272-1600

INTERNATIONAL SEARCH REPORT

International application No.	PCT/US05/27239

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation Sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of any additional fees.
3. ☒ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.: 1-7 and 17-24

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

1. This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claim 1 -7 (in part) drawn to an immunogenic composition comprising a purified Group B Streptococcus adhesion island polypeptide.

Further species election to one composition comprising GBS AI –1 or GBS AI –2 required (see paragraph # 3).

Group II, claims 8-16 (in part) drawn to an immunogenic composition comprising a purified gram positive adhesion island polypeptide.

Further species election to one composition comprising one bacteria and one GAS AI –1 ,GAS AI –2,GAS AI –3 and GAS AI –4 required (see paragraph # 3).

Group III, claims 17-24 (in part) drawn to an immunogenic composition comprising a first and second purified Group B Streptococcus adhesion island polypeptide.
Further species election to one combination of first and second polypeptide (see paragraph # 3).

Group IV, claims 25-34 (in part)drawn to an immunogenic composition comprising a first and second gram positive GAS AI –adhesion island polypeptide.

Further species election to one combination of first and second polypeptide (see paragraph # 3).

Group V, claims 35-39 and 40 (in part)drawn to a modified gram positive bacterium and a method of manufacturing adhesion island antigen
Further species election to one modified gram positive bacterium required (see paragraph # 3).

Group I is directed to an immunogenic composition comprising polypeptide GBS AI –1 or GBS AI –2 whereas Group II is drawn to immunogenic composition comprising gram positive bacterial adhesion polypeptides GAS AI –1 , GAS AI –2 , GAS AI –3 and GAS AI –4 . These inventions are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1 because these two compositions do not share a common structure ,property and function as group I contains GBS polypeptide where as group II comprises GAS polypeptides . Group III and Group IV are also drawn to compositions as group III comprises combination of two polypeptides from GBS that shares no common structure ,property and function with Group IV as it comprises GAS polypeptide and thus do not share a single inventive concept. Thus these inventions are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1 Group V is drawn to a modified bacterium from GBS , GAS and non-pathogenic gram positive bacterium comprising expressing polypeptide GBS- AI -1or GBS-AI-2 and not share a single inventive concept from other four groups as the composition contains polypeptides which does not share a common structure, property and function.

INTERNATIONAL SEARCH REPORT

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2. This application contains claims directed to more than one species of the generic invention. These species are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for more than one species to be examined, the appropriate additional examination fees must be paid. The species are as follows:

3 Group I species: GBS AI –1 80, 104, 52, 59, 67, 150, 01521, 01523, 01524 or GBS AI –2
Group II species: GAS AI –1 , GAS AI –2 , GAS AI –3 and GAS AI –4.
Group III species: Any combination of first and second polypeptide from GBS AI –1 80, 104, 52, 59, 67, 150, 01521, 01523, 01524, GBS AI -2.
Group IV species: Any combination of first and second polypeptide from GAS AI –1 , GAS AI –2 , GAS AI –3 and GAS AI –4

Group V species : Modified gram-positive bacterium or non pathogenic bacterium expressing GBS AI –1 80, 104, 52, 59, 67, 150, 01521, 01523, 01524, GBS AI –2 , GAS AI –1 , GAS AI –2 , GAS AI –3 and GAS AI –4
The inventions listed as Groups 1-5 do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

The technical feature of linking groups appears to be that they are all related to immunogenic compositions comprising adhesion peptides methods of making adhesion peptide.
However, Beckmann et al Infection and Immunity, June 2002, p. 2869-2876, Vol. 70, No. 6 disclose an immunogenic compos ion comprising adhesion oligomeric polypeptide (see page 2871, left column last paragraph through right column and figure 3) As this polypeptide binds to fibrinogen it is an adhesion immunogen. Therefore, the technical feature of linking groups 1-5does not constitute a special technical feature as defined by PCT Rule 13.2, as it does not define a contribution over the prior art and hence unity of invention is lacking.
The special technical feature of Groups 1-5 is considered to be immunogenic compositions comprising polypeptides that share no common structure, property and function and thus do not share the same or a corresponding technical feature .

Accordingly, Groups 1-5 are not so linked by the same or a corresponding special technical feature as to form a single general inventive concept.

The claimed species GBS AI –1 80, 104, 52, 59, 67, 150, 01521, 01523, 01524, GBS AI –2; GAS AI –1 , GAS AI –2 , GAS AI –3 and GAS AI –4 have no common structure and thus are not linked by the same or a corresponding special technical feature so as to form a single general inventive concept under Rule 13.1. Hence, unity is lacking among species.